

June 1951

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X-Y-Z

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①

Notes taken in 1932

0001

June 1 Left Holliston 8:20 A.M. - arrived St. Albans, Vt., 7:20 P.M. Travelled all day.

June 2 About 1 mi. S. of P. on E side of road to Stites Pond - Lower 50' reticulated Dolomite. Underlying Rock River formation, unfossiliferous. on west side of main road.

P. Highgate Spr.

Wallace Creek formation - $\frac{1}{2}$ mile S of P. and on St. Armand road. Stites Pond at east and N side of road. Wallace Creek on N side of road about 30 yds. from road. Contact of Wallace Creek & Stites Pond unconformable - W.C. very fossiliferous at base. Upper Wallace Creek Dolomitic. Toward Morgan Corners formation overlying W.C.

$\frac{1}{3}$ mile E of Phillipsburg are imfaulted blocks (slices) of Wallace Creek in Morgan Corners formation. Very fossiliferous containing many "Syntrochma". This slice (or slices) are from the upper part of the Wallace Creek probably. There is no proof of this as these rocks have not been seen in the main mass of the Wallace Creek. The chief brachiopod in the W.C. blocks is a Syntrochma like shell. The shell & another suggest Canadian. There are also Polytoechia-like shells.

0002

(3)

June 4

Traveled from Phillipsburg to Montmagny.

June 5.

From Montmagny to Matapedia

Just at the village limits of Val Brilliant I stopped to collect from the Val Brilliant sandstone, a hard quartzitic rock. From loose blocks excellent Pentameroides were obtained.

June 6

1.2 miles east of Dawsonville, new road cuts in very hard heavy bedded massive calcareous sandstone. Dipping steeply to N.E. Concludium very abundant, Styrax, Stenotopora, corals. May be Crileman's St. Leon formation.

June 7.

Spent most of day collecting from the La Vieille (at Quinn's Point, 3 miles East of Jacques River). Fossils are not abundant and are hard to get. It rained in spots most of the day and was very cold and windy.

④

June 8.

Snow and rain all morning. In afternoon went to Black Rock and collected for about 2 hours. Was unable to find bed with complete small Stenelaudia although I saw many poor separate valves. I believe that the beds at Black Point are not La Vieille but I don't know where they go in the section. Perhaps they are uppermost Clemville. Lithologically the beds are not unlike those of the La Vieille being knobby. There is an evident lack of corals, & Stromatopores as compared with the Quinn Point exposures.

June 9.

Rain most of day - went to Dalhousie with Dr. Smith. Collected about 5 hours. Stewarti bed is mostly of soft ash. Shells abundant collected in beds at brook which were quite bare. Beds 8 & 9 I think are inseparable.

June 10.

Rain all day - prospects of clearing not good. packed one box.

June 11

21 paces towards Cape Bon Ami from the Stewart bed are about 10 or 15' (horizontal) of hard sandy sh. ss. and ash beds which I shall call bed 17. These are exposed at low tide only. Collected fossils all day - Good day.

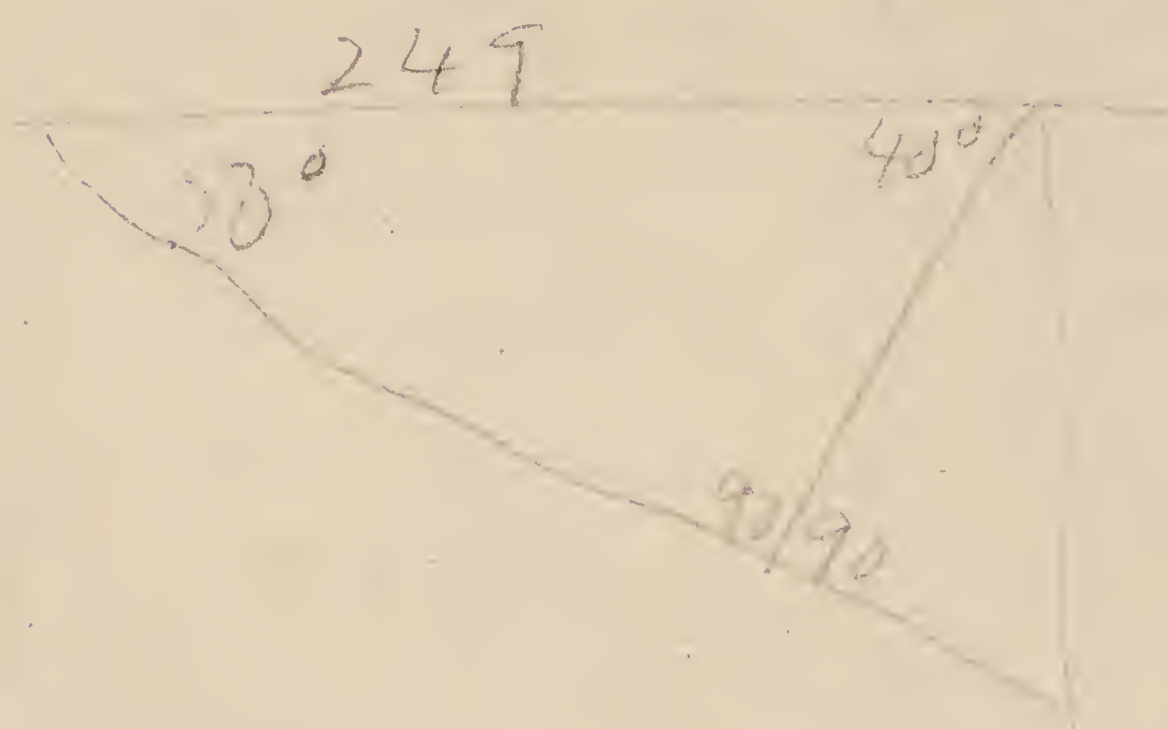
June 12

Dip on bed
7 is 52°
NNE

Sunday - returned to Dalhousie chiefly to take notes and collect from beds exposed at low tide only. Bed 7 is in contact with the Barbic andesites which are amygdaloidal in the upper part. Bed 7 is hard arenaceous limestone containing many corals. The lower contact is very irregular and the lowest bed is a hard ls. 1-2' thick. Bed 7 is 5 to 7' thick. To my mind the fauna of bed 7 is essentially the same as that of 8-10. except there are more corals in 7.

Bed 8 - sandy sh, ashy, bluish grey weathering brownish on surfaces, said to be 20'. I see no definite separation from bed 9. faunally or lithologically. Has clams like bed 9.

Bed 9 is the one from which most of the large & good fossils come. The brook cuts thru about the lower third of the bed.



$$\begin{array}{r}
 97 \\
 6 \\
 \hline
 12 \overline{) 582} \\
 \underline{49}
 \end{array}$$

$$\begin{array}{r}
 97 \\
 2 \\
 \hline
 194 \\
 49 \\
 \hline
 243
 \end{array}$$

0004a

Strike +
dip on
ls bed (2')
N 51° W
46° NNE

A considerable distance NE on the beach, is a bed of ls. about 2' thick, called bed 15 (as near as I can make out) for which no list of fossils is given. The bed is crowded with *R. stewarti* + *S. concinnus*. For 25 paces SW on beach from this bed (Howard Brook) *R. stewarti* occurs (This I call *R. stewarti* zone). From contact of bed 7 and Barberie Decite it is 97 paces or or about 243'. According to the book (Howard) there are 180' between the hard ls + the contact.

I fail to see the usefulness of beds listed by Howard as it is nearly impossible to identify them. I saw no *R. stewarti* in the bed 11. but they were abundant in beds 12-15. It seems to me it would be better to call the section by the name of zones.

Bed 0 - coarse arenaceous shales
N 55° W 50° NE. Dip on bed 1 - 2 N 65° W 49°
Dip + strike on hard ls about 200 yds NE of
base of Bed 1 = N 45° W 45°.

June 13

350
90
440

175

6

21050

87

90

Packed boxes in morning, departed for Campbellton where I met a Mr. H.A. Carr who helped me get my stay in Canada lengthened. Left for New Richmond from Matapédia at about 2 P.M. arrived 5 P.M.

After supper collected from Pleistocene at New Richmond. Clay with abundant Saxicava rests on Bonaventure conglomerate. Clay from 10-20' thick. A similar clay with Nysa was seen above the Devonian at Dalhousie (Stewart's Cove).

June 14

Black Capes — Glenville N36° E 60° SE thin bedded sandy shale & limestone alternating. Contains Coclospira and Chonetes. Blue is at least 50' exposed.

La Vieille — knobby ls., sandy & shaly, bedding uneven. Weathers to a mottled reddish and ash grey. Strebliandina abundant in base N60° E 61° NW. I made the La Vieille about 450' feet by pacing. The Gascons succeeds the La Vieille. The upper La Vieille is less knobby and a little darker in color.

Lower Gascons less heavily bedded than La Vieille N52° E 68° NW

pips here are SE.

0006

Upper Gascons is made up of
red & green sandy shales
S78E 55° S. Fossils are not
abundant but lime bands have
sponges, corals & Bryozoa.

June 15
Stayed at Herbert Journé's home
Gardien Point - Grey crystalline ls. dipping
40° SE and striking N30° E

June 16
Anse à la Vieille - Great thickness
of knobby ls. Underlain by ss.
Strike N51° W 29° S. Fossils abundant
but hard to get.

June 17
Collected from West Point ls. all
day at Reddish Pt. Rock exposed
as rounded (from solution) masses
of reddish & light massive limestone.

June 18
Collected cephalopods in morning
at Anse à la Barbe. Afternoon
visited Pt. L'Enfer for about
1 hour then went to West Point
and collected Bouleaux fossils.

Population 1200 For Center, E. W.
Industry
Topography
General plan
" appearance

0007

June 19

Collected Clemville at Clemville.
most soft crumbly arenaceous
sh. and harder ls. bands.
Fossils common but hard to get.

Port Daniel, small village whose main
industry is fishing. Some farming done
by inhabitants, several sawmills in
town. General appearance is poor, most
of people are poor. One lobster canning
factory. One large new hotel. One
hotel (Defunct (Le Grand's) and Hotel
Port Duhiel closed up. The village consists
essentially of 3 parts Port Daniel West,
Port D. center & Port Daniel East or the
main portion of the village. Port
Daniel River forms a Barrachois at P.D.
East, R.R. and village located on the bar,
Covered bridge over Fickle. Same for
Little Port Daniel River at Port D. center
P.D. is surrounded by low ridge-like
hills. The West Pt. limestone is one of the
main ridge or hill formers. This is
shown at Pt. L'Enfer where there is a
ls. quarry, the ridge running N from the
Point. From West Point to Chaudan Point
the ridge and cliffs are held up
mainly by West Pt. ls. The Bascons
commonly forms the low ground
being arenaceous sh. ss. and
arenaceous ls. This runs the bay
at Port Daniel West and also
forms the low ground at
Chouinard Brook & Cause aux Bascons.

At Anse à la Poudre, low cliffs rim the shore which are formed of the Upper Bascons but. & inland from these is a ridge, the backbone of which is West Point Trinidad. The La Vieille makes high ground from Port Daniel (St. George's Church) to the north, and in the vicinity of Clemville.

Population of Port Daniel 1776, founded 1855. Fishing, ls. quarrying, agriculture, a little lumber.

New Richmond - Pop. 2,534, founded 1831 - Mostly farming & lumbering

Rene' Parish founded in 1854 - Fishing & agriculture, Butter factory, cod liver oil plant, lumber for local consumption

Pence's

June 21 - Arrived about 11 A.M.
 Lunched and went immediately to
 collect from the Cap Blanche formation
 in the South flank of Mont Joli.
 Trilobites are still plentiful in the
 thin band ~~that~~ carries them but they
 are difficult to get at.

June 22 - Rain + fog - Went behind
 Ste. Anne to the Amphitheater, locs. 5, 5a
 and collected. Collecting good in the
 thin ls. bands. Rock mostly a soft
 rotten shale containing innumerable
 thin-bedded ls. In places alternation of
 ls. + sh. frequent, others no lime and in
 still others argillaceous ls. abounds, but
 nowhere is it just pure ls.

Collected at F₁ on Priests road. Blocks
 are difficult to find along the road.

June 23 - Spent 2 hours of
 morning at South flank of Mt.
 Joli for more Trilobites. They are
 now very difficult to secure. Spent
 afternoon at F₆ + F₇. Former now
 has very few good fossils. F₇ is no
 longer any good.

June 24 - Rain all morning

Daniel J. Cunningham & Thomas Gault
collected on the St. John River.

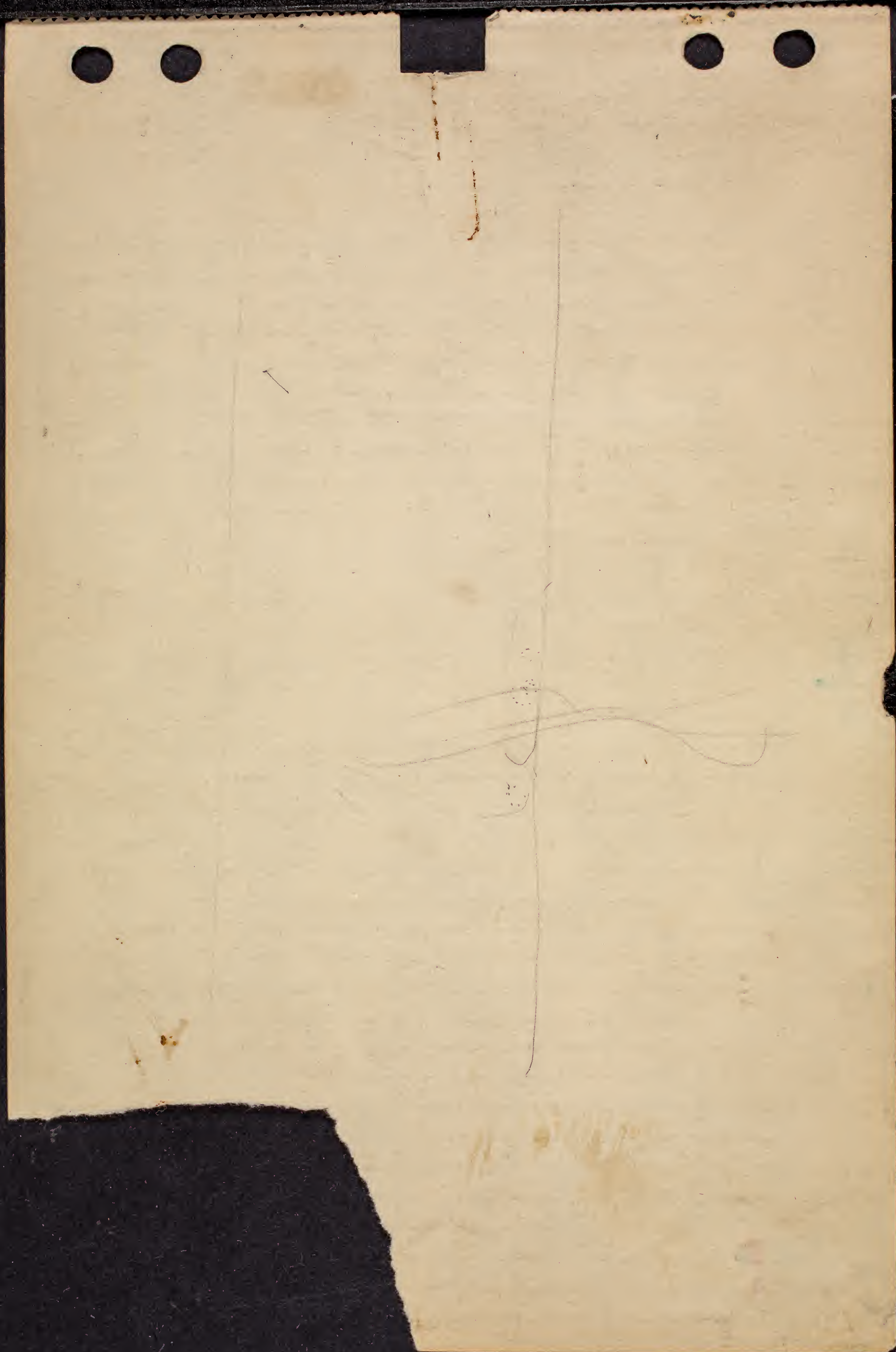
Left back on mineralogy
Stuyvesant ESE of Haldimand Head.
in a new scallop bed.

Get Mr. Richmond a lens.
Sunday July 17 arrived at Batavia
Mon July 18.

Tile Factory - Stream running NE near
road alongside of tile factory is not
White Creek but a branch of it. In
front of the house (first S. of tile factory)
on SW side of road the Lichenon is
exposed in the gutter and a little to the
N at the P. Point this is exposed. Lichenon
also exposed in bed of stream.

Tue July 19.

The hard layer in Black Creek
at Canada that I thought
might be Stafford proved to be
a hard band, probably of the
Shanestales.



0011

October 8, 1934

Washington - Wytheville.

October 9.

Visited Ottosee localities in vicinity of Rye Cove. Ottosee is mostly calcareous shale. Nodules and slabs contain fossils as well as shale. Echinoderms can be collected $1\frac{1}{2}$ mi. S of west of Rye Cove near an old brick school. Collecting is good if one hunts hard.

October 10.

Collected from Ottosee? $3\frac{1}{2}$ miles SW of Horn Hill. Here found small *Oligorhynchina* at one level. The beds containing them were called Ottosee by Rye. They underlie the red Holston Marble west of Rockwood.

Oct. 11.

Rockwood to Camden - Spent hours on more collecting. Leipers and Richmond 6 and 8 miles west of Nashville.

Oct. 12.

Collected from the Camden sheet from pits of Nashville, Chattanooga + St. Louis Ry., and the Camden Gravel Co.

Oct. 13.

Collected Birdwing fossils on farm of Will Love. This is reached by going on Hy. 69 south 10 miles toward Holladay, then turning south west on old road. Love's farm is 0.9 to one mile on this road. The exposures are just south of the farmhouse near a small creek and along the

old road to Holladay.
 Late evening collected
 Hammam chert 11.5 miles south
 of Camden.

Oct. 14.
 Camden — Walnut Ridge, Ark

Oct. 15,

Morning to Black Rock Quarry. Yellow
 gray dolomite and massive, brittle
 gray limestone. Fossils scarce.

Afternoon spent on piles of excavated
 earth from manganese prospect
 pits. Snails abundant by brachiopods
 very rare. Pits located 1.4 miles
 N by east of Smithville. Arrived Batesville
 4: P.M.

Oct. 16.

Searcy Mine — Collecting all day.
 Only chert bed about half way up?

Oct. 17.

Collected at Searcy mine all day.
 Go east on Highway 111 about 5 miles
 from center of town (Barnet Hotel)
 to # about opposite Pfeiffer and go
 west on second road crossing H 11.
 Follow this 3 miles to Cave Creek.
 Go on Cave Creek road two miles to
 spring bearing right at intersection
 0.3 mile northeast of point where
 Pfeiffer & Cave Creek roads meet.

Oct. 18.

Collected at Coon Mine and
 6-7 miles West of Batesville and
 at White River Junction.

Oct. 19.

Collected at Carson Mine Tunnel
Mimulus about 20' from (above)
Girvanella beds. Packed boxes
4:30 - 5:30.

Oct. 20.

Collected at Carson Mine - real
Mimulus occurs so low on the
beds with Girvanella (mineralized)

Oct. 21.

Packed fossils and headed bags.

Oct. 22

October 11

Collected Pechu shale east of Silver City. Go east of Silver City to New Mex Hy. 180 which comes into main road at Central. At Santa Rita take road for Georgetown and Mimbres. 1.4 miles east of Georgetown black shale appears. Then comes the gray (yellow) Pechu above abounding in fossils. At Hairpin turn in Mimbres the Pechu appears to the north in a small ravine. Here it is very fossiliferous and all the New Mexico species described by Kindle can be found. The hills on both sides of the valley contain Pechu shale and this is an excellent place for further investigation.

October 12.
El Paso

At lookout over El Paso is contact of El Paso ls. and Montoya limestone. Upper part El Paso very fossiliferous and contains brachiopods suggesting Odenville.

In afternoon went to Van Horn via U.S. 62 and Texas 54. First mountains east of El Paso are Hueco Mtns. Road enters Pow Wow Canyon. Not far inside the entrance a view to the north shows two small knobs just west of a high Peak. Westernmost knob is excellent collecting place for Hueco fossils.

October 13.

Beach Mtn section exactly
10 miles north of Van Horn.
Lower part mountain with
Bliss ss. showing scolithus
tubes. Then follows ls + dolomite
of lower Canadian age about
50 feet in all. Syntrophina was
common. Above this came about
40 feet of coarse ss. Above the
second ss. comes Ceratopora
incuvata zone. Just above the
Ceratopora come brachiopods
suggesting Oligorthis oklahomensis.
Following this come two more
Ceratopora zones in the upper
part of about 800 feet of limestone
and dolomite. At top of section
come 50+ feet of nodular
dolomite weathering yellow +
crumbling to small fragments.
This contains many bivalves.

Following the El Paso are
ss and dark dolomite of
Montoya formation

October 14.

Left Van Horn & went over to Marathon arriving at lunch time. After lunch went to hill $\frac{1}{2}$ mile north of Hess Ranch for Hess fossils. Cincoidal limestones contained brachiopods but specimens were rare and poor.

Oct. 15 spent at Split Tank. Take Hess ranch road turn east behind Hess collecting locality and go east about $7\frac{1}{2}$ - 8 miles. Split Tank is about $1\frac{1}{2}$ east of the Grimmer Ranch. Collecting is best on north slope small hill east northeast of tank and also in shaly or limestones material about one mile east northeast of the tank.

Oct. 16 - Collected Split Tank in morning and Word formation west northwest of Word ranch. Collecting not good.

Oct. 17 - Collected Split Tank.

Oct 18 - Packed boxes most of day. Visited graytobite beds on Alsate Creek. Go south of Marathon to Picnic grounds then go west on road to J. J. Roberts Ranch to Alsate Creek. Went to Fort Stockton in night.

Oct. 19.

Thursday afternoon visited Mississippian outcroppings Ellenburger on Llano River about 14 miles south of Mason. On south side of Llano opposite junction with Honey Creek, 14 miles S of Mason great reefs of Cryptozoa appear high in the Wilberns. One isolated reef about 40 feet high is especially fine.

Oct. 20

Travelled from Mason to Llano collecting Forthis on bank of San Saba River at ford east of Camp San Saba. Road to ford is about $\frac{1}{4}$ mile south of San Saba River bridge north of Mason.

In afternoon made unsuccessful attempt to find Huerella in canyon of Cold Creek. We searched lower member of the Wilberns on the point of the hill 0.9 mile up the canyon and on the west side. Forthis was discovered 40 feet above Lee Lion Mtn. ss. which separates the Cap Mtn and Wilberns formations.

Oct. 21.

In morning went out to Plectrotophia Butte of Bridge for these brachiopods. Elongated specimens are abundant on top of this hill and adjacent hill to west. On east side of hill Huerfella was found, with Billingsella about 72' above base of section. Round in afternoon saw several parts of the Ellenburger formation north & east of Cherokee.

Oct. 22

Left Lane for Austin. Studied Ellenburger between Round Mtn. & Bee Cave. Collected Cambrian (Acrotreta) one mile east of Sandy, P.O. Sent Bell a specimen.

Oct 23.

Spent day in Austin.

October 24

Left Austin for Cisco which we reached at 12 P.M. After lunch went to Eastland; then north on Breckinridge road for 12 miles. Then take dirt road east about $\frac{1}{2}$ mile to Gunsight. Go south on road in Gunsight about 1.2 miles or just below first branch to east. Go east around base of hill to east-facing bluff for collecting.

Gunsight can be reached from Cisco by going about 3 miles north of intersection of Cisco & Breckinridge roads. After Gunsight went to Mineral Wells for the night.

Oct. 25

Collected at Union Hill school about $6\frac{1}{2}$ miles NW of Mineral Wells. Take fence line N of school for $\frac{1}{2}$ mile to collecting locality.

Called on Rempert. Send them Dumbor & Condra on brachiopods. They will take any fossils in exchange for them.

King Marathus
Rept to Rempert

October 26.

Send and papers
on Pennsylvanian
to Renfro

Spent day in field with Renfro. Collected at Salesville Quarry from a thin shale bench near bottom of quarry. Later in day collected on Ramsay place, 3 miles east of Jonesboro, Texas.

Oct. 27.

Left Texas for Ardmore, Okla. which was reached at lunch time. After lunch went to Rock Crossing. Go south on Hg 77 for $5\frac{1}{2}$ -6 miles. Take road going west for 1 mile west, then go south 1.1 miles then turn west for 0.7 mile to new bridge.

Multicostella with coarse ribs abundant in about 5' to east of bridge. Just above it come small *Strophomena*. Rock to at small *Strophomena* bed changes from fine lined stone to fine grained bitules. For a considerable distance above small *Stroph.* trilobites are common. About 50 below top of light ls. brachiopods are common. The lowest zone is *Doleroides*, *Hebertella* &

Strophothris, Oxoplectra. Then follows uppermost beds with large Strophomena, large fine ribbed Multicoella, and brachiopods. Which calls all this whitish ls. Criner formation.

Oct. 28.

Took in Duke Coll. for silicified Rhynchotrema from Lawrence. Collected upper Criner in section 26 near Hickory Creek. Packed boxes. Then went to see section on Hwy. 77.

Oct. 29.

In morning went to Vines Dome which is about 2 miles NW of Dougherty. The Hargis St. rises into the road from Dougherty and can be easily recognized.

In afternoon we visited White Mound. So south ^{from Sulphur} on Okla 18 to Nebo. Turn west for 3 miles to a gate facing a road going south. Go through gate to north. Bluff on west of pasture road about $\frac{1}{4}$ mile from gate gives good collecting. The White Mound is about $\frac{1}{4}$ mile farther to the W. The Hargis is almost limestone rather than a shale.

Oct. 31.

Collected lower Bronide 1.5 miles west of Nbo by roadside. A thin layer 2" packed with *Valconera*.

Collected till noon on Hagen. Visited Quarry at Lawrence.

Nov. 1.

Oklahoma to Rolla, Mo

Nov. 2

at Rolla

Nov. 3

Morning went from Rolla to Lupus. Walked 2 miles SE of Lupus down RR track for Nehobenia. We failed to find them.

Afternoon went over to Clifton City to collect Callaway. 2 1/2 miles from center of village on road to south. Like Callaway 5-10' overlies Cooper. In upper 3-4' occurs peculiar lobate *Athyrid*.

Nov. 4.

Went southeast to Birch Tree.
 About 10 miles north of Birch Tree
 is Pine Hollow school. On
 slope north and northwest of
 the school building blocks of
 chert abound, that contain
 many Gasconade fossils.
Syntrophina is very abundant.

Nov. 5

Went from Van Buren to
 Eminence to collect Eminence
 fossils on Shannon Co. Hg. F,
 4 miles south of Eminence.
 From here we went to Dutchtown
 to see the Everton which is
 exposed in the village. St. Peter
 is well exposed by State highway.
 Then we saw Seneca Quarry, the
 type section of the Dutchtown
 just east of Dutchtown. Dark
 brittle thin bedded limestone
 with ostracods and a foot thick
 layer crammed with Lophospira.

1932, 1939, 1941

November 11

Left Clayton and went to
Conchidumb ledge and on to
Kokomo for night.

Nov. 12.

✓ From Kokomo to Evansville, Ind.
to see Carl Bays, who is to offer
Museum his collections of
Wisconsin, Ordovician.

Nov. 13.

Stayed in Boonville previous
night & drove on to New
Albany and called on Mr. Campbell
about 10 AM.

Went to Salem RR cut for oolite
Then west of Borden for
Syringothyris

✓ Send Mr. Campbell any
Devonian Bryozoan literature.
Send Mr. C. a set of Hamburg
oolite. Send Mr. G. a recent
Trigula.

✓ See Sutton Jour. Geol., vol. 45,
no. 3, Apr. - May 1937, for new
term Speeds which is same
as Mr. Campbell's bed D. May =
all of Delaware

Cigar box & Cotton for loose
specimens.

Mr. Campbell's new address
will be 40 Stephens Kirkham,
Condon, Indiana.

Send Mr. C. my paper on
Paleoecology. Also West studies
brachs.

1940, 1941

4.59

Trip to Texas and Tennessee
1940

7.94

Aug. 6 - left Washington 7 A.M. arrived
Morristown, Tenn. 16 P.M. Central time

12.86

Aug. 7 - left Morristown, Tenn. 6:30 A.M.
arrived Memphis, Tenn. at 6:20 P.M.

11.61

Aug. 8 - Memphis to Little Rock, which was
reached at 10: A.M. Had car greased & oil
changed. Drove on to Mt. Vernon, Texas in
rainstorm.

11.62

Aug. 9. Left Mt. Vernon 7:45 A.M. reached Fort
Worth 12:30 P.M.

0.85

Aug. 10. Collected in Finis shale at
two localities. 1. on each side of road
0.3 miles NE of intersection of Old Chico
road with Wizard Wells road, and 2.
on each side of hills from $\frac{1}{2}$ - 1 mile
north of locality 1. Intersection of
Wizard Wells - Old Chico road is 3.2 miles
east of Jackboro CouthouseQuite a question over name of this
shale M. R. thinks it is upper Finis.2. Hills $\frac{1}{2}$ - 1 mile north of locality 1.

2.2.2

Aug. 11. First locality visit was Finis
shale along Rock Island RR about
0.2 mile east of bridge on Texas 199, 3.7
miles SE of Jackboro. Collecting good.
Also collected along base of hill
 $\frac{1}{2}$ mile NE of above locality.One half mile S of Chico-Jackboro
dy. (Texas 24), 5 miles NNE of Jackboro
Couthouse on old Gunters Ranch
are extensive exposures of shale in
Jackboro ls. Collecting good. Upper bed
abounds in *Quadrina*.

L

1.69 Aug. 12. - Visited at Texas Christian Univ.
Met Gayle Scott.

0.90 Aug. 13 - Along Hwy 199, 6 1/2 - 7 miles
northwest of Jacksboro occur
exposures of shale and ss. The
shale contains ironstone nodules
that break up and yield good
fossils, rhynchonellids and sp. Texas
The shale contains a few fossils
notably small goniatites. Visited
three localities in this vicinity.

1 1/2 miles SW of Berwick, Jack
County occurs a hill, called Potato
Hill, probably 80-100' high. The top
8' of this hill contains fine productids
Neospirifer and fusulinids.

2 pictures of Potato Hill.

3.34 Aug. 14 - Went to Graham to look
for Leptozoa. Saw section at dam
1/2 mile north of bridge 1 mile west
of Graham. In Wayland just above
Gunsight is fossils occur.

Collected Hog Creek sh. NW of
Jacksboro. Collected Jacksboro shale
6 1/2 - 7 miles NW of Jacksboro. Collected
in Thunderstorm.

2.07 Aug. 15. Morning visited Brannon Bridge
ls. near Brock. Afternoon collected
shale in Palo Pinto Co. 2.9 mi. W of
road junction of State road & U.S. 80.

10.92 Aug. 16 - Worked low hills extending
NE from bridge on Texas 199 out
the Rock Island RR. These hills
extend NE to Kansas place east
of Jacksboro. Collected Jacksboro
shale for a mile. A glade 1 1/4 mile
NE of bridge is apparently fine
shale.

2.

Collected 1/2 mile West of bridge, also

③

0035

in Finis shale. This locality is along an old abandoned RR.

Aug. 17.

Ed. 93 Texas 199, $\frac{1}{2}$ mi. NW of Junction with US 281 and $\frac{1}{2}$ mi. S of road where we collected "Necessity" shale.

Collected on old Gunter Place in Jacksboro shale.

2.55 Aug. 18. Visited localities in Jacksboro southwest of Jacksboro

3.89 Aug. 19. Called on Powell Goodwin in Archer City, Texas. Collected Shifty formation east of US 281 on road 3.6 miles northwest of Junction of US 281 & Texas 199. One exposure is 0.6 mi. east of US 281 on dirt road. The other is $\frac{3}{4}$ mile S (downstream) on a small creek 2.9 miles northeast of US 281.

1.58 Aug. 20. Collected Gonzales shale at two localities, one 3.9 miles NW of Finis and the other 5.3 miles NE of Finis. Former locality rich in small snails, latter one in clams. Found Poikilozabes at both places.

3.55 Aug. 21. Riley place, both sides off hill about 5-6 miles NE of Jacksboro. Fine collecting.

Pictures 1, 2 - Potato Hill

3.9 - Gonzales shale & Bringer ls.

3.9 miles NW of Finis

5-6 & Kenfuss.

ENE



1. West face of hill on
Riley Ranch, about 1.5
mi. N. of Riley Ranch House
and about 5-6 mi. ENE
of Jacksboro.

2. East slope between
2.5-3.5 mi. N of Riley
Ranch House,

(4)

0036

2.38 Aug. 22 - Riley House at junction of Old Chico and Wizard Wells roads about 3.2 miles E of courthouse in Rockton. Visited Ramsey place. Not as good as last year.

7.46 August 23 - Left Fort Worth 7 A.M. arrived Fort Stockton 5:30 A.M. Spent hour in McCamery shopping and having car serviced

2.45 August 24 - Left Fort Stockton about 8 A.M. and arrived in Marathon at 9:30. Went to Split Tank and collected for rest of day.

2.03 Aug. 25 - Went to Split Tank collected Lower half of Leonard.

Aug 26. Pictures 7. south face Leonard Wk.
8. NEast face L.M. from Hess R
9. Fault NW of Hess Ranch

Went to Split Tank, made large collection! All told have as much stuff as collected in '39.

Aug. 27 - Collected Gap funk fossils east of highway $1\frac{1}{3}$ miles (7000') and about 6 miles NNE of Marathon (King's loc p. 43). Aptacanthia fairly common in middle exposure.

1.59 Aug. 28 - Back to Split Tank. Collected all day. Now have fine collection.

Aug. 29. - Morning collected at Word Ranch found goniatites. At 11:30 went to Word locality north of Hess Ranch. Rained out at 1:30. Spent afternoon wrapping fossils.

Aug. 30. Collected all day in
Word formation about 6 miles
N of Hess Ranch.

20.24 Aug 31. Collected all day at Gaptank.
Heavy rain in evening. Packed
two boxes.

Sept. 1 Packed boxes all day
long. Rain in afternoon.

7.22 Sept. 2. Collected Word N of Hess Ranch
in afternoon. Rain all morning.

2.74 Sept. 3 - Collected Word N of Hess R.
and at head of Hess Canyon

Sept. 4 - Collected Wolfcamps in
Wolfcamps Hills.

Sept. 5 - Spent all day packing

16.58 Sept. 6 - Shipped boxes - Collected Hess

Sept. 7 - Came from Marathon to Cisco,
Texas

Sept. 8. -

2.75 Bird Teguliferina to Renfro.
" Cowbird of Tennessee to Renfro.
Visited Dinsight locality. Collected
from 8:30 AM - 4 PM. Went on to Fort
Worth.

Addresses for exchanges to
Renfro.

8.48 Sept. 9 Car serviced in morning
Drove to Mt. Pleasant, Texas
in afternoon.

(6)

0038

8.57 Sept. 10. - Drove from Mt. Pleasant, Texas to Jackson, Tenn.

5.18 Sept. 11. Drove from Jackson to Camden. Spent afternoon in gravel pit south of town. Not now in operation. Good fossiliferous white clay mostly washed away. Collecting not good.

2.45 Sept. 12. Spent morning at Steel Bridge over Big Sandy River about 11-12 miles north of Big Sandy. Collecting good but exposures small.

In afternoon went 1-1 1/4 miles upstream from Steel Bridge and collected Birdsong shale in bluff on east side of river.

Sept. 13. -

3.30 ~~Sent Eugene Love, Rte 2, Holladay Tennessee, a copy of Dunbar on Devonian of Tennessee. Sent 10/5/40~~

Collected at Will Love farm. Collecting poor except for small things. Place much visited!

Farm is located on east side of Tenn. 69 just 10 1/2 miles S of junction of Tenn. 69 + U.S. 70. Locality is just about four miles N of the center of Holladay.

2.67 Sept. 14. Left Camden and went to Jeanette. Found no exposures SE of this place. Local people asked knew of none. Silurian limestone (Decatur) is exposed 1 1/2 miles NE + about the same distance SW of the village.

6. Took quarters in Parsons. Drove from Perryville to Decaturville and back to Parsons. Sent off a box + keg of fossils.

⑦

0039

246

Sept. 15-

1.00

Bobs Landing road off Ky 69 and NE or east about 4.3 miles. Road to Landing opposite store selling from J.K. May's store. It is 7.8 miles from main street of Decaturville down to road leading to Bobs Landing from 69.

Went to Bobs Landing. Collecting in brachiopod beds can be had from a glade just west of northernmost part of Tennessee River bluff 1/2 mile N. of Bobs Landing. Found better collecting about 0.2 mile NW (of words Bobs Landing on map) of Bobs Landing and about 1200 yards east of northernmost house between a small creek (dry) and a fence line. An old road crosses the glade. Brachiopods were abundant and good.

An old man took me to a glade in Beech River, about 1 mile WNW of Bobs Landing. Bluish limestone and calcareous shale probably 30' in all containing Astracypora, occasional Travertine and Laminites. Brachiopods were rare and in general poor. 1 picture, no 1 on 35 film - poor.

Sept. 16 - Visited Brown's port Furnace.

Go from Decaturville to Vixtown which is approximately summit of the TVA sheet 32 SW. about 1 mile by road from Vixtown bend the old Furnace road goes right to the old furnace site. The old brick hotel is still standing. Glade on south slope of hill just NW of hotel building. Exposes Bob + Lobelville. Former richly fossiliferous at base. Lobelville abounds in bryozoans. Failed to find the Beech River sequence although Dixon is exposed in hill

to SW of Furnace.

In afternoon visited Blue Mound Glade which can be reached $1\frac{1}{2}$ miles to west of hotel and then take indistinct road going west from sharp angle in old Furnace road. Follow old road for 730 paces bearing left at both forks. Take left bend at fence + cross creek; glade is up hill from creek. Collecting excellent and horizon is same as that in base of exposed section in hill NW of Furnace.

Sept. 17-

Revisited Blue Mound glade and relocated it as 730 paces almost due west of angle of road or 600 yards (0.3 mi). Collecting excellent and found over 100 Lysidula roemeri.

Visited glade about 0.2-3 mi. north to NNE of right-angle bend of county road about one mile west of bend at Visetown. Lower 15-25' of Beech River exposed. Collecting poor. Dixon at base of glade.

Collected for 2 hours at glade just S of Mt. Lebanon school. Fossils abundant but poor. At intersection of county road and old road Dixon is well exposed. Collecting was in lower 15-20' of Beech River division.

Sept 18 - At intersection of Brownsport Landing and Visetown road the Dixon is exposed in the road bed and to east of Visetown road. About 100 yds. east of Visetown road the Dixon is overlain by about 5' of shale & 6" limestone beds containing Pisocrurus and a few other fossils. A light gray clay on Dixon contains the small Crinoids but they also occur in shales above.

all start at 2 of road
N 70 W 25-1
W 119
S 55 W 24 to creek + 46
S 80 W 26 to center of glade
3.25

Road from Mt. Lebanon School south to Mt. Lebanon Church exposes a good section of the Beech River but larger fossils are not abundant. The Devon is exposed at the angle at the school and a large glade exposes lower BR to south. The church rests on yellowish clays containing Unicrinus saffordi, Syringidula nemesis which suggest the lower Bob. About 75' north of church on each side of road a 3' ledge of ls contains H. stichlandi of the lower Bob. This ls. forms the flat on which the Bob shale & the church rest.

Sept. 19 - Large glade S of Perryville is actually 1.5 miles by road from the Beech River Bridge and 1.8 miles from the old Perryville RR Sta. The glade is large but fossils are not numerous. Spent most of day on glade but did not get anything worthwhile.

3.40 Sept. 20 - Car service in morning. Went to Blue Mound Glade in afternoon. Section there is same as Basslers 2 b, c, for the glade NW of the Furnace. Developed motor trouble on way home. First of trip.

3.14 Sept. 21 - Searched vainly for the Graveyard Glade. No one seemed to have heard of it. Was led to cedar grove. Visited two glades approximately 1 1/2 miles W of Bob and one almost exactly 1/2 mile west. Two of these glades proved to be in the Washington beds of the Bob.

Sept. 22 - Mrs. Duck, manager of hotel claimed to know a good collecting place at Decaturville and took me there on Sunday. Place proved a dud. Went back to Mt. Lebanon School locality for 3 hours collecting. Some young men said the place is much visited. The scarcity of larger fossils rather bore out their remarks.

0.60
18.00
Sept. 23 - Moved over to Linden in morning. Had a look at the section at the Pine Mill. Exposes nearly a hundred feet of Silurian capped by Hardin ls. On SE slope of hill SSE of Mill found glady slopes with a few brachiopods, *Bygonia* and many *Pisocrinus*. The bygonian beds of the Lobelville. Found several specimens of *Calceola*.

In afternoon collected coral beds of Lobelville about 0.15 mile upstream from junction of Jack Branch and Short Creek on road opposite house. Corals fairly abundant.

Sept. 24 - Gilmore bridge about one mile NNE of Lobelville. On SE side of road new cuts expose bygonian beds of Lobelville with *Leptodonta* and fine-lined *Atropa*. Possibly these beds are lower part of coral bed. Above these in woods above the bridge for one tenth mile small corals can be found in the soil but the whole slope is thickly covered with leaves and brush.

At crossing of road and Harris Branch bluish gray limestone is exposed. About 5' above water a thin layer with *Conchidium* was found. Above this

layer. The rocks are shaly and contain corals both cup & tabulate which suggest Lobelville. My guess is that the Conchidium belongs to the Lobelville.

0.95 Visited spring in bluff about 0.6 miles NNW of town. Section in bluff about 25' exposed. Downstream occurs coral bed with Conchidium, locality mentioned above.

Just north of west bridgehead at junction of Tenn. 13 and 50 shales rotted down to clay contain corals and bryozoa, undoubtedly belonging to the Bryozoan zone of the Lobelville.

The Conchidium collected at Lobelville belong high in the coral zone.

At 1 P.M. it started to rain in earnest and I went home.

Sept. 25 - In morning packed three kegs and then took them to Hohenwald where I shipped them to the Museum. In afternoon went back to Beardstown along river north of bridge on Tenn. 50. Here 21 feet above river level and about 1/4 mile N of bridge found Rhipidium knappi concretion in a thin zone. Below it occurred U. sticklandi, Sypidula, W. saffordi and a few other brachiopods which suggest the Bob. I saw no beds that suggested Beech River.

Left Beardstown and went to mouth of Jack Branch. No corals occur there but are abundant about 0.2 mile upstream.

Visited small quarry (about 30') 0.7 mile east of junction of Tenn 13 and 20 on N side of latter. Quarry is mainly heavy bedded ls., light blue gray in color. Near top is a

- shaly zone about 3' thick containing brachiopods suggesting the Bob. As the Bob red zone is exposed on a small bench above the null I imagine this quarry is in Decatur limestone. I am wondering if, Lobbville, Decatur and Bob are one & the same thing having lateral shaly facies and coral facies

133

Sept. 26 - Bluff at Mousetail

- 0.95 A - Dixon exposed at S end of bluff at turn by old storehouse and occupied house.

38' E B. 55' mostly limestone crumbling to small fragments (shale). In lower 15' some porosity and small hemispherical corals. At 21' found Plectatypa. Limestone beds up to a foot thick form occasional ledges. At 55' comes heavy-bedded gray ls.

14-15' D C. - About 25' of massive limestone forming a bench. This is probably Basal Eucalyptocrinus zone.

D - purplish shaly weathering limestone alternating with greenish shaly limestone and with harder layers that form ledges. 14'-15'. Most of corals seen weathered and lying on slopes were derived from this layer. Found Rhipidium here also

55' B E - Hard massive limestone to top of hill and forming a flat top. Limestone is cherty and contains many crinoid stems. Decatur ls?

Dixon A

Section at Lady's Bluff

Started section about 100 yds N of house at S. end of bluff.

A - Light blue gray shaly ls. Between 18 + 21' above river level saw *U. sticklandi*. This is unusual for Beech River. About 42' of shaly ls.

B - Harder, nodular gray limestone, 5-15' Light gray with brachiopods.

C - Partly covered but mostly of grayish green ls, somewhat shaly 16'.

Linden?

D - Shaly ls. containing brachiopods & *U. saffordi*, *Polymene*, *Gypidula*.

E - Purplish and greenish shaly ls. Contains corals. Probably should not be separated from D.

60±

F - Decatur, 60'±.

G - Linden ls. ? Entire top of hill covered with chert. Saw no evidence of shale although it may have existed here.

15'±

8'

D. Top of hill goes about 20' above top of Decatur making hill about 175' above present river level.

16'

C

5-15'

Uncinulus?

The section given here was taken mainly at the point putting into the river on the north side of a small creek that comes into the river. South of this creek the section is somewhat different. The so-called *Uncinulus* bed is either more weathered or not so thick as to the north. My mention of *U. sticklandi* in Beech R. may bear this out. Found *Orthis* in red-green shaly zone same as at

30-

42'

monstail. This section seems to me to be about the same as the Monstail one, a little thicker because of the complete section of the Decatur and more of the shale zone with the red beds. Saw corals in lower Decatur which may indicate presence of the coral zone.

Sept. 27 - by side of road opposite house, $1\frac{1}{4}$ miles (airline) SSE of Pine View, up Walsdorf Branch, about 0.7 mile S of Tomp Creek, Perry County, are 3-4 feet of shale yielding many corals like those exposed on Jack Branch.

$\frac{1}{4}$ mile N of bridge over Coon Creek on Tenn. 100 is good exposure of brachiopod bed sandwiched between two layers of heavy-bedded ls. The shale bed with brachs is about 2' thick. This same brachiopod bed seen in Ay on Hy 20.

The brachiopod bed in the Ay on Tenn. Hy. 20 is about 20' below the Hardin ss and the ss lies in place about 8' above the top of the Ay. There must be either much erosion at the top of the Silurian or unsuspected facies changes.

Intersection of Coon Creek and Hy. 100 is probably Foerste's locality for *Anchidium lindnerensis*. I hand-levelled down from Hardin ss. about 70 feet but rock is covered at level of *Anchidium*. Possibly if there were a ford at the Creek pit Foerste's more rock was showing then.

Sept. 28 - Peeler's Pond a great spring issuing from the high bluff. Rock for about 3' at spring is red but above that is mostly greenish or bluish. According to a man met on

3.30

The road the highway formerly went along the base of the bluff. Now the highway runs about 15 feet above the level of the pond. The bluff was blasted to get the fill for road. About 10' above the road is a 3' shaly bed containing Strombodes. 1/4 mile south of the Pond (where spring issues) on east side of road scraping of bench has revealed a shaly corall. bryozoan bed which is between the Strombodes bed and the red bed at the base of the sequence. The spring is located about 600 paces south of Peckers Hollow.

South side of crossing of Cane Creek by Tenn. Hy. 50 and for 0.4 mile upstream are 15' of coral beds at base of section. Over these are some 38' of heavy-bedded limestone and over this is the Lunden with Camaroceras.

12.75

Sept. 29 - Visited Pegram on Mill Creek. Spent most of day there.

Good section of Silurian but poor in fossils along the road (Tenn. 13) beside Buffalo River about 1 mile NW of Flatwoods. The whole section appeared to be most Beech River.

In late afternoon stopped to see Natural Bridge on way to Waynesboro.

0.40

Sept. 30 - Spent day at Clifton and vicinity. In morning went ENE of town to point where road bend ESE. Along the river bank at this point the Fernvale formation is well exposed and can be followed NE along the river to a conspicuous bluff a few tenths of a mile from the bend in the road. At the bluff the rock has been quarried or at any rate is fresh. The shaly part of the Fernvale is bright greenish

blue. Fossils occurred about one foot below the top. The thin Brassfield is exposed well along the shore here. This is followed by the red Osage shaley limestone and the top of the bluff by the pinkish Laurel ls.

After seeing this section walked west from old Cement Mill along the bank of the river. The section is covered where Mud Branch enters the river but a short distance west the top of the Laurel appears and scattered blocks of Waldron with Plectambonites tennesseensis, Stephanocrinus and other fossils. Then follows the Laurel and the Dixon and finally the Beech River forming most of the bluff west of Clifton. This is the west limb of an anticline the center or axis of which is near the point where the power line crosses the river. Going east of the power line the Hermitage forms the bank for a long distance, nearly to the hotel. This is overlain by Anheim and the Fernvale which is exposed below the hotel and at the Ferry landing. Farther east the Silurian sequence is repeated on the east limb of the anticline.

Made a good collection of inarticulate brachiopods from the Hermitage.

Oct. 1 - Martins Mills in morning. Hill just south of the cluster of houses exposes an excellent section with Beech River at base and top with Gant ls. on top. Gant limestone comes to road level perhaps a half mile S of the mills. Hillside N-NE of mills showed Beech River at base and Hardin about middle of hill. Forester's section is undoubtedly up the small stream, although he speaks of being 57' above the beach.

Good section of Beech River with fossils in hill a mile north of the mills collected here. Several small crinoids are common with an occasional *Trochoceras*.

Just SW of schoolhouse one mile west of Houston the rocks have been blasted out for the road. Just NE of the school is about 10 feet of massive limestone abounding in brachiopods, which is overlain by the Hardin. The fill of blasted material unfortunately has either been picked or is not very fossiliferous.

Oct. 2 - Went up to Short Creek north of Lego school. Thought it hopeless to try and find Forster's locality for *Conchidium*. Went up old road north of Short Creek and found a glade showing about lower 5' of Beech River and its contact with the Dixon. The whitish clay at base of Beech River was well exposed but had few fossils. Above Beech River exposure are poor but upper 35' of Silurian is exposed below the Hardin. It is massive heavy-bedded x-line ls.

Visited Miser locality 1/2 mile opposite Lego. This was exactly like the one above. Fossils can be cracked out of the x-line ls.

Went 1/2 mile N of Whiteoak School corners to Miser *Conchidium* ledge. Opposite first house on West side of road just 1/2 mile north of the corners at the school an old road goes east into the woods. This road goes over rotten x-line ls and shaly beds abounding in corals and bryozoa. About 100 yards from auto road old road branches, one branch going to the NE (left) up the hill. This branch of the road crosses the *Conchidium* ledge which may be followed to the NW around the hill for some distance. I make

the ledge about 8-10 feet thick on the front of the hill facing west and it is about 22-25' below the Hardin ss. Above the *Conchidium* corals are also fairly common and an occasional coral may be found with *Conchidium*. I think the *Conchidium* belongs with the corals. The few brachiopods present are like *Lobelville* or *Bob* types. Found one *U. tennesseensis*. I have a suspicion that *Bob* = *Lobelville*..

Oct. 3 - Beside the road on the north side of the entrance to the Jewell Spring and about road level a layer of earth, yellow-weathering ls. contains large *Conchidium*. Went up hill to north of Jewell (the white) house. At base of hill is shaly material with corals, but nearly entire remainder of section is crystalline ls. right up to the Hardin ss.

1.66 After lunch Mr. Jewell took me to a glade along an old road about 1/2 mile SSW of the Jewell house. Corals are exactly like those under *Conchidium* ledge. *Conchidium* was present here but rare. At this place shale of Beechwood type is interbedded with ls. Presence of *Favosites* &

Oct. 4 - In morning collected from glade slope on U.S. 64, 6.8 miles east of Savannah. Got good *Bob* brachiopods and a whole *Colymene*.

At noon collected at a glade 3.85 miles east of Savannah. Suspect glade is Rockhouse shale. The shale 10' + occurred over a few feet of hard limestone showing in a ditch east of glade.

On Indian Creek went along bluff facing Olive Hill. Saw

Lobelville, Decatur, Ross, Bear Branch and Pyburn.

In evening found glade 100 yds N of US 64 and 0.6 miles SW of Wayne-Hardin County line. Here purplish shaly ls. contained abundance of *Astrocospongia*, *Calceola* and a few other Beech River types.

20.28 Oct. 5 - Left Waynesboro 9:45 and arrived Murphreesboro about 2:15. Met Jo at about 4:45.

6.40 Oct. 6 - Went from Murphreesboro to Nashville. Visited two localities of Pegram given by Peoples. Hamilton part of Pegram is thin and sandy. Onondaga part is granular x-line ls. Part seems to be pre-Tropidoleptus and probably definitely of Onondaga (upper) age. Spent rest of day collecting Waldron and Ordovician.

1.34 Oct. 7 - Went to Vanderbilt to see C. W. Wilson at Vanderbilt. Spent 2 hours with Born & Pond of Tennessee Survey. Saw Wilson at Vanderbilt. Saw Pohl & Peoples collection of Pegram. Specimens labelled as *Sp. gregarius* are not that species. One looks like a *Retinularia* and the other a small *Spirifer*. Saw no unequivocal Onondaga species in the whole collection.

Wilson had fine specimens of *Cryptophragma* from the Lebanon.

Wilson had stuffish from Murphreesboro. " " collection from Sequatchie Valley containing *Fascifer*. He regards this horizon as Pierce. This horizon is high Othello. The *Pinnodonta stenos* is a *Fascifer*.

Left Nashville about 1 PM and went on to Murfreesboro where we collected Murfreesboro fossils on the south side of Stones River, west of U.S. 41. Here the WPA is building an army and a great deal of dirt from the upper part has been known out. We made a large collection.

Oct. 8 - First stop was at bridge over Stones River about one mile southwest of Lascassas on Tenn. 96. Here Murfreesboro lies in stream bed. Pierce comes over it on east side bridge and the Ridley overlies the Pierce. We collected 1.45 Murfreesboro and Pierce.

Next visit was to old Pierce Mill, $\frac{1}{2}$ mile S of Walter Hill on Tenn. 10. There is a small exposure near power plant of thin ls. with bryozoa. Much of the material is without fossils and is quite vanghamitic in character.

Visited Ridley on N side of road crossing Stones River a mile due east (airline) of Jefferson. Here near top of exposed sequence we found Protorhynchoceras.

Visited Niece's Mill where Pierce is well exposed. Here Protorhynchoceras occurs in the bryozoan beds near top. Over the Pierce we found Ridley Rhynchoceras in soil.

Oct. 9 - Spent morning at Marshall Knobs on Ridley. This is more massive limestone than the Pierce but in general is very fine-grained brownish gray but the top weathering light ash. All through the formation Rafinesquina like deltoides is abundant with a Strophomena. Protorhynchoceras occurs throughout the Ridley.

In afternoon took US 41, road to Manchester, found fresh cut in Lebanon and collected many fossils. *Leptæna* & *Strophomena* common with a *Rhynchotrema*.

7.71 Oct 10. - Took US 705 to Woodbury. Collected Lebanon en route. At big bend of road just east (1/2 mile) of Readville we collected *Cryptostrogon* in Lebanon, had *Sowerbyella* in beds just above it.

D. 4 miles
E. of Lebanon

Afternoon collected Hemitoge between 1 and 1 1/4 south of Woodbury on both sides of the road (Tenn. 53) to Manchester.

3.81 Oct. 11 - Ask Wilson for a squeeze of *Bathyrinus* from Murphreesboro; also one of the starfish.

Went to Shelbyville and Belfast to collect Lebanon. Poor success.

3.10 Oct. 12 - Packed and shipped 13 bags of fossils. Includes most of my Silurian and all the Ordovician we collected.

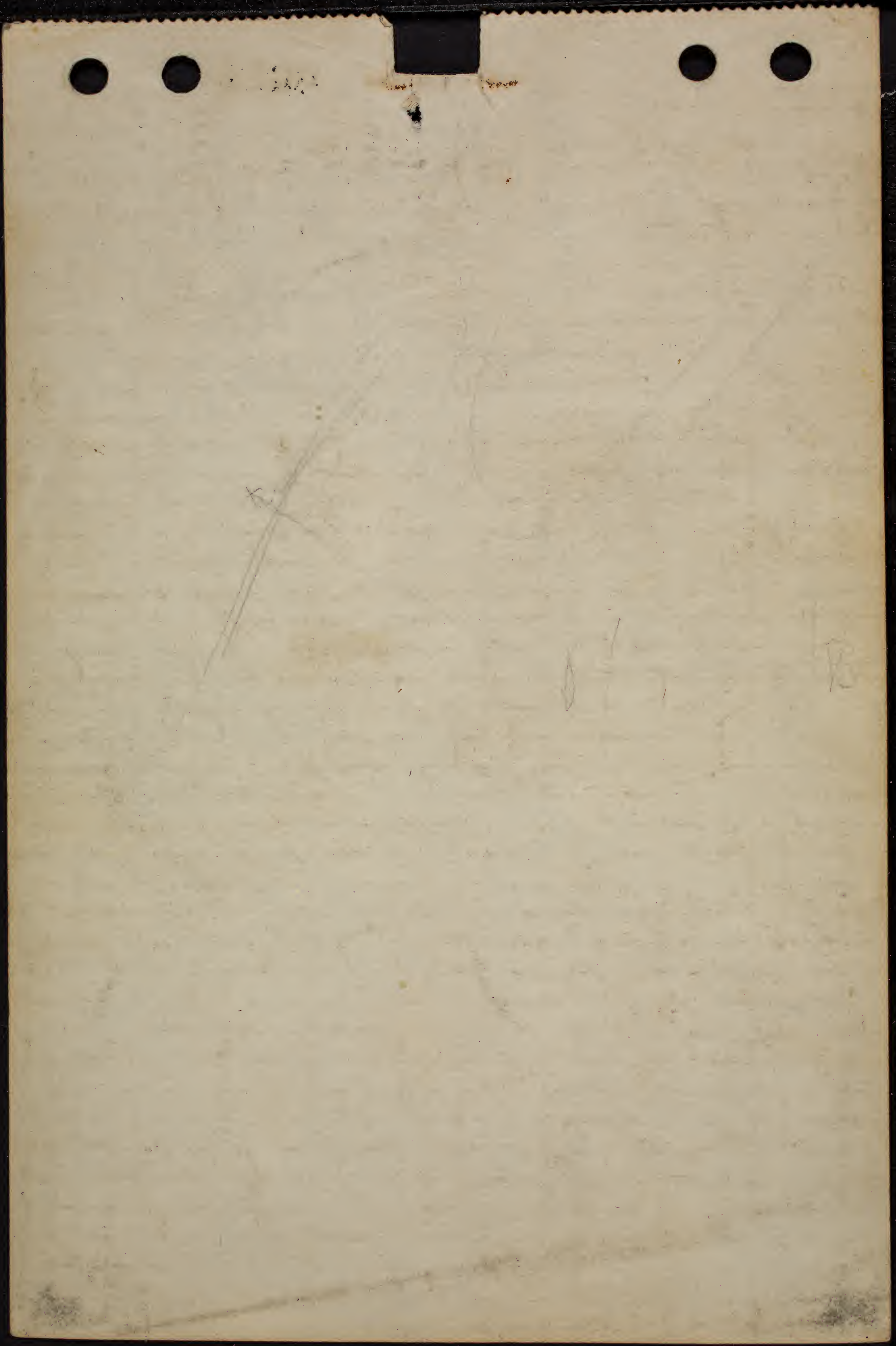
In afternoon collected Lebanon along Tenn 10 between Murphreesboro and Lebanon.

Oct 13 N 70 E 30° S taken on what we think is Lebanon about 18' below Trenton and 25 feet below Bentonite which is about 6" thick. I believe I have found *Pionodema minuscula* in top of Louville 5.4 miles NE of courthouse in Maynardville on Tenn. 33.

13.89 at this locality shaley and limy Martinsburg contains *Leptæna* fossils. *Dalmanella*, *Sowerbyella*, *Dinorthis*, *Rhynchotrema*. This is same bed as we collected in 1939 near Cumberland Gap. 25' below a thick Bentonite in the Martinsburg we found *Pionodema minuscula* Willard and a sequence lithologically like Lebanon. This supports my view that the Louville of the Appalachians is all or part of the Stones River of the Central Basin.

5.62 Oct. 14. - Collected O Hores fossils south of Evans Ferry. Drove from Jaxewell Tenn. - Salsum, Va.

6.13 Oct. 15 Drove from Salem, Va to Washington, arriving at 2 P.M. Final mileage 28689



Sept. 29, 1940

Pegram on Mill Creek, N. of
Topsy, Tennessee. TVA Topsy 27

Point out in paper if any of Pegram is really Onondaga there must have been big interval between Lower Onondaga (Cauden) and Upper Onondaga Sp. acuminatus zone to have produced the Cauden and Clear Creek cherts, which generally are chert wherever known.

The Pegram on Buffalo River in bluff on west side of mouth of Mill Creek north of Topsy is about 6' thick of hard light to dark gray crystalline limestone, irregularly bedded in layers from one to two inches up to nearly a foot. Contains many stromatolites. Basal layer in bottom few inches contains concretions and a green mineral probably glauconite. Fossils are scarce throughout. Saw nothing while collecting to indicate anything of Onondaga age. In basal bed occurs Favosites turbinatus suggestive of Beechwood with a large wrinkled Schuchertella in middle of formation saw possible Vitulina (or dorsals of Cyrtina). Near top Cypricardina is common. All fossils seen suggest a Hamilton age for whole layer rather than any Onondaga.

Sp. gregarius is only real Onondaga fossil in Pegram reported by Peoples. It could be a Delaware form. In paper show Nucleocrinus vernanti also a Hamilton type. Pegram may all be Hamilton.

After examining my specimens

0056

Collected today I believe I do have
Vitulina and they come from about
the middle of the formation. This
I think makes the presence of any
Onondaga very doubtful.

Look for collections Miser may
have made

See Jewell in Hardin Co Report
Rods may = Pyburn

Texas and Oklahoma 1941

June 10 - Left Washington, 7:45 AM with Jobridge. Lunched in Roanoke, Va. Called on Harry Todd in Bluefield, Va. at 5 P.M. Arrived Fagerwell, Va. 6:30 P.M.

June 11 - Saw sections around Fagerwell with B. N. Cooper, Butts + Beran.

June 12 - same. Visited Burkes Garden.

June 13 - Went to Ceres in morning; collected at Porterfield Quarry in afternoon. Left for Bristol and went on to Morristown for night.

June 14 - Morristown to Memphis. Collected Lebanon 11 miles E of Lebanon. Found *Protorhynchus* in Lebanon. Collected Waldron at Prison Quarry east of Pegram.

June 15 - Memphis - Mount Pleasant, Texas. Rain in Texas. All rivers very high.

June 16 - Arrived Fort Worth at noon. Time Newell had already arrived. Called on Renfro in evening.

June 17 - Met R. H. King in morning. Went to Bridgeport & collected in shale pit there, then went on to Jacksboro and collected east of town.

June 18 - Collected Jacksboro east of Jacksboro. Then collected Gonzales Shale 9 miles SE of Graham. Went over to Ganssight & collected Wayland shale. Got several *Poikilosakos*.

2

June 19- Worked hill slopes $\frac{1}{2}$ mile north of Union Hill School, 6 miles NW of Mineral Wells, in morning. Collected from Millsap Lobe formation about 8 miles SE of Mineral Wells where snails were abundant. Went back to Fort Worth with Ralph King and picked up Museum car. Went on to Jacksboro for the night.

June 20 - Collected at Gunter place from 7 A.M. nearly to 11 A.M. Got 7 sacks of fossils. Went on to Midland, Texas. Called on Bob King in evening for a few minutes.

June 21- Spent morning with Bob King and a short time with Ronald De Ford. We then went on to Fort Stockton where we called on J.M. Montgomery a rancher for permission to go on his place. Reached Marathon for supper.

June 22 - Went up to Split Tank for the day. Collecting not as good as previously.

June 23 - Spent day at Split Tank.

June 24 - Spent day at Split Tank. Place not now so good.

June 25 - Collected Split Tank east of Fort Stockton road. Left about 3 P.M. Rain.

June 26 - Collected basal Word on slope north of Word Ranch. Took away most of concretionary mass of other years. Waagenocrinus is abundant in lower Word. The lower Word strongly suggests the upper Leonard at Split Tank. Rain in early afternoon. Packed two boxes

3 June 27 - Went to Wolfcamp hills and collected at locality found last year. This is definitely in the main mass of the Wolfcamp thick limestone and is about 15 feet below the top of that limestone. Made another collection here. Then collected from King's bed 9 which is exposed on the slopes south and west of the fork of the Canyon going into the Wolfcamp hills. Rained in afternoon.

June 28 - Worked all day in Wolfcamp Hills. Collected mainly from lower part of bed 9. Did not find some of the things reported by King. Thick limestones are chiefly reef masses, we think. Collected Uddenites zone on Wolfcamp front but found no good specimens of Parenteleles. Violent thunder storm at night.

June 29 - Collected in 3rd ls. of Word north-northeast of Hess Ranch in Hess Canyon. Made enormous collection.

June 30 - Collected again in 2nd & 3rd ls. of Word. We found no satisfactory division between these limestones.

July 1 - Back to Hess Canyon to work on 4th ls. of Word. This proved to be so poor that we gave up and went back to the 3rd ls. Came in about four and packed boxes. To date

July 2 - Collected south slope road Canyon about 1 1/2 miles west of east end. Fossils very scattered and collecting poor. Went over to Skinner Ranch for permission to go on their property. Rained out at 2 P.M.

4 July 3 - rained the hills at junction of road and Silliland canyons. Fossils scattered. Collecting poor. Went over to Clay Slide. Saw few fossils. Rained out at 1 P.M.

July 4 - Looked over Wolfcamp suprounding sill about 3 miles north of Hess gate on road to Split Tank. Found few fossils. Collected Leonard from faulted block $1\frac{1}{2}$ miles east of Hess gate and about 0.1 mile south of road. Got good Striatifera here. At noon went to town barbecue and rodeo.

July 5 - Collected Wolfcamp and Hess north of Decie Ranch in first spur of hills south of Cathedral Mtn. Scacchinella common but sporadic in occurrence. Lives with beak down and growing to one another like Rhynchonella. Made good collection from both Wolfcamp and Hess. The Scacchinella were taken in about middle of low hill and about 20'-30' below the top in fine-grained massive limestone. The Wolfcamp bed was somewhat above the middle of the slope.

July 6 - Worked over Leonard and Word north of Decie Ranch. Found the collecting poor, fossils very scattered. Went to Lenox to see Wolfcamp which is mostly a conglomerate. Went back and collected more Scacchinella north of Decie Ranch.

July 7 - Back to Split Tank for the day. Rained in afternoon but we stuck it out. Norman found 4 blocks with Unicrinella and they occur just above the base of the Leonard, between the Hess and the beds containing Unicrinuloides.

5- July 8- Spent day at Split Fork. Made a large and fine collection.

July 9- Spent morning between Split Fork and Word ranch. After lunch we got started collecting west of Word Ranch in Leonard when it rained. We came home and packed four boxes.

July 10.- Collected Leonard west of Ferdymakers place in vicinity of Old Word Ranch. Section mainly yellowish platy rock with fossiliferous ls. lenses. Uppermost lens contains many Aulosteges but they are hard to get. Collecting is good at bottom of formation. Packed three boxes in evening.

July 11- collected Word at Hess Canyon all day long. Good day, no rain. Packed two boxes before supper.

July 12- Went to hills north of Decie Ranch (King's loc 35) to collect Scacchinella. Had excellent success taking a number of large specimens from a single boulder.

July 13- Drove out to Leonard Mountain to collect Leonard ls. Collecting proved very poor so we went up to Word Ranch and collected until 3:30 when it started to rain. Packed two boxes in afternoon.

July 14- Back to hills with Scacchinella but we failed to find any first rate specimens. Collecting depends on finding a properly rotted block, not too rotten so that they crumble nor too fresh so that they crack through.

6 July 15 - Went to Wolfcamp hills. Most of our material comes from slopes formed by beds 3-9 or possibly 10. My material collected last year is from top of bed 2. Rained out about 3 P.M.

July 16 - spent morning collecting No 4 limestone of the Wolf about one mile north of Fenstermaker's place. Collecting only fair. In afternoon collected Leonard at Word Ranch. Fair all day.

July 17 - Packed boxes and got them ready for shipment. Took Norman to Alpine to take bus. Dunbar delayed.

July 18 - sent off 13 boxes and 2 kegs. Sent 5 boxes to Wisconsin. Total for trip thus far 27 boxes and 2 kegs. Dunbar & Morris arrived 9:30 P.M.

July 19 - All day at Split Tank with COB and P.M.

July 20 - All day collecting Split Tank Southeast of Split Tank

July 21 - Collected at Scacchiella locality (loc. 35 of R.E. King) until 3 P.M., then went to Alpine. Found few Scacchiella.

July 22 - Spent day at Hess Canyon collecting Word. Collected to. No 4 at east end of Hess property at Split about 1/4 mile west of elbow in Canyon.

July 23 - Spent all day at Split Tank. Thunder storm came up about 2 P.M. Came home & packed boxes. Cooper has 2 more boxes ready.

7 July 24 - Wolfcamp hills till 2 P.M.
When we were rained out. Most of our
brachiopods are from 9-12 limestones.
The fossils occur where the limestones
are massive and reefy.

July 25 - Got run out of Wolfcamp by
branch foreman. Went to collect Leonard
at Word Ranch. Thunderstorm about 2 P.M.
Finished packing.

July 26 - Packed up and shipped 3 boxes
and four kegs. Got ready to leave Marathon

July 27 - Marathon to Cisco.

July 28 - Went to Gimsight; collected all
morning. Went on to Fort Worth which I
reached at 4 P.M. Called on Renfro that
evening.

July 29 - Went with Renfro and collected
lower Graham and Thifty north of
Jacksboro. The first locality is on west
side of Post Oak road three miles
north of Jacksboro. The locality was
good for several types of molluscs
and a few brachiopods.

July 30 - 0.6 mile north of Finis, Texas
and near fork of Byrd - Bradford roads
in top of Rangel limestone Teguliferina
is abundant. In afternoon visited
Gonzales Creek shale $3\frac{1}{2}$ miles NW of
Finis on road to Graham.

July 31 - Collected Lower Cretaceous around
Fort Worth. Particularly after
echinoids for exchange collections.

August 1 - Collected Graham west of Perrin in morning. Went to pit near Saltville in afternoon.

August 2 - Collected west of Fort Worth in Lower Graham in morning; same level north of Fort Worth in afternoon.

August 3 - Collected Hog Creek shale and Ranger in morning and in the Jacksboro level on the Ramsay place in the afternoon.

August 4 - Mostly bummed around Fort Worth. Wrote letters in morning, shopped in afternoon. Went out with Kenfies in the evening. Mrs. R. wants an exchange of Michigan fossils.

Aug. 5

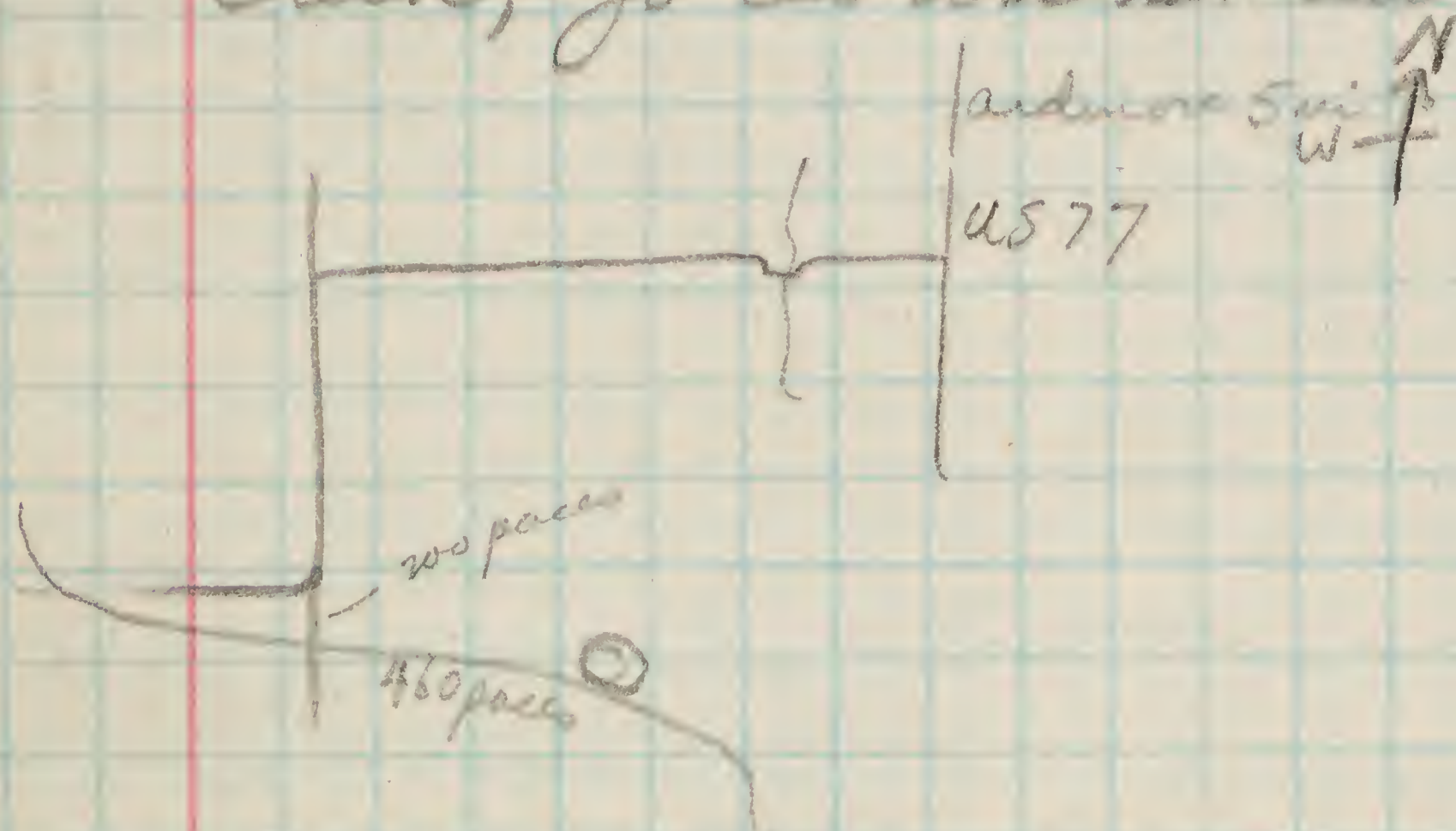
Darison shale - E. side road, $\frac{1}{2}$ mile south of Dexter, Cowley Co., Kansas.

For excellent Mayes ls. 16 mi. NE of Fort Gibson, Sec 17 or 18 - 15 N - 21 E, $\frac{1}{2}$ mi. S of pavement on N side hill, ~~also~~ U.S. 62. Distance is probably nearer 10 miles. Left Fort Worth and went on to Norman, Oklahoma to visit with Dr. Decker and Dr. Dott. Called on C. L. Foster in evening.

Aug 6 - Back to Ardmore. Collected at Rock Crossing most of day. Collecting poor as rocks had been well washed by many rains.

9

Aug. 7 - Visited Bromide locality in sec. 26 in Cramer Hills. To get to this place go south of Ardmore about $4\frac{1}{2}$ miles (measure from turn with traffic light on west edge of Ardmore) on US 77, turn west crossing Hickory in about a half mile and continue to west to road end. Turn south and go about 0.9 mile to sharp west bend. Old road continues south. Back and walk old road 500 feet (200 paces) to creek, go down stream 1150' (460 paces)



Spent afternoon on Bromide west of US 77. Found Sowerbyites zone at very base of section.

Aug. 8 - Went over to Sulphur and visited Ordovician locality on highway about 1.8 miles SSE of town. Rain rest of day. Packed four bags.

Aug. 9 - Spent day at White Mound. Collected in morning on slopes $\frac{1}{4}$ mile SE of the mound. Collected on mound all afternoon.

Aug. 10 - Went back to White Mound. Collected at cattle tank for 2 hours then worked along the hills $\frac{1}{2}$ miles NW of White Mound. Fair collecting in upper Haragan. Went up to Ada between three and four o'clock.

10.

August 11 - Met C. G. Lelicker of Univ. of Oklahoma at 10 A.M. in Ada. Lelicker agreed to pilot me about the Stonewall Quad. for 5 days. We went first to collect Wetumka shale southeast of town and then Boggy farther south. Collecting was good.

Aug. 12 - Rain most of morning but we went north toward Holdenville to find some of Girty's Wewoka localities. All of them we visited were very poor collecting.

Aug. 13 - Made a try at Holdenville locality NE of town but it was much grassed over. Went back and collected at Wetumka locality SW of Ada.

Aug. 14 - Searched for two Boggy localities and a Wapanucka locality on Canyon Creek west of Jessie. Then visited a Haragan locality southwest of Jessie. This was very poor collecting. Went to collect Boggy E. SE of Ahlosa. One small glade was very good.

Aug. 15 - Went back to glades ESE of Ahlosa for our best collecting of the trip. Went to collect McAlester south of Fittstown then went to Cedar Hill for Henryhouse shale. Collected $\frac{1}{2}$ mile west of Cedar Hill and on glades about in center of 10-2N-6E.

Aug. 16 - Packed 3 bags in morning and shipped 7 bags to Washington. Early afternoon went to brick pit south of city. Spent 2 hours here then went to quarry at Lawrence for a couple hours.

Bags sent in to Aug. 16.
 9 boxes - 2555
 13 " 12 keys - 3850
 5 " 4 " 1400
 2 " 7 " 1113
 9328 lbs.

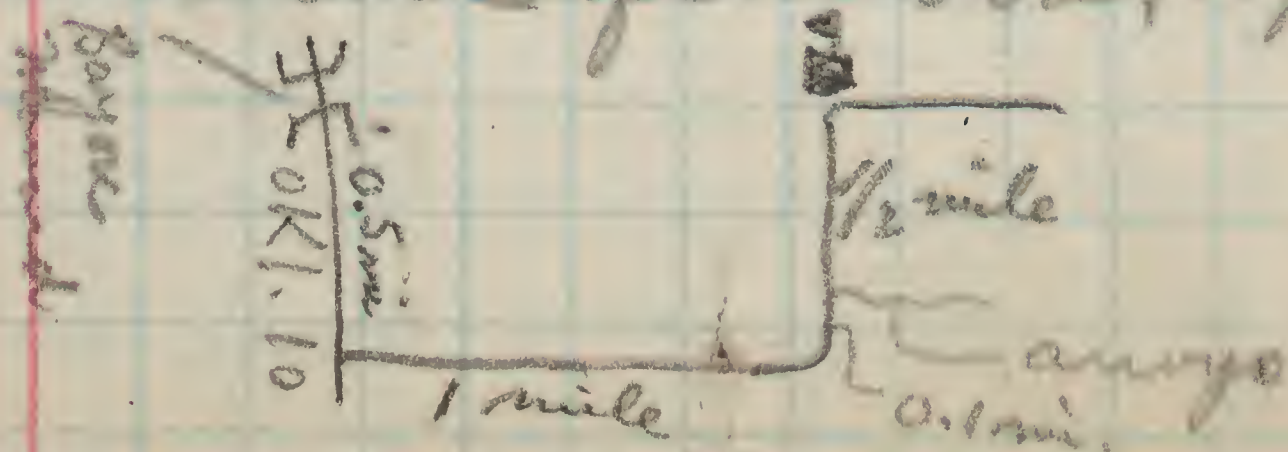
11.

Aug 17 - Collected Henryhouse shale in vicinity of Cedar Hill, 8 miles south of Ada. Locality is 2 miles east of Okla 99 in south half sec. 4 - 2N - 6E.

Aug. 18 - Went to Norman and picked up K. L. Foster, then went on to Muskogee. Collected Marginifera at a railroad cut in Dewar.

Aug. 19 - Collected Mayes ls east of Fort Gibson. Locality is reached by going east of Fort Gibson to Bayou Mandard crossing of U.S. 62. 0.8 mile east of the Bayou is a road going south that can be identified by two wooden bridges close together. Go south for 0.9 mile to bridge over large creek, go on to ford of brook and take the left fork of road, cross small wooden bridge go on taking right fork which after a mile from the ford crosses the Mayes ls. Collecting excellent

Aug. 20 - Visited Mayes locality at bluffs on south side Bayou Mandard on west side of Oklahoma 10. Collected here till lunch time. After lunch went to fields just 0.1 mile south of Glendale school. Here brachiopods were abundant. Just 0.1 mile north of bend in road about $\frac{1}{2}$ mile south of the school X in an arroyo on the east side of the road about 100 yds to east Fayetteville fossils are abundant. To get to Glendale school go east on dirt road $\frac{1}{2}$ mile south of Bayou Mandard bridge, go east one mile to bend, turn north for about $\frac{1}{2}$ mile.



Aug. 21 - Rain in early morning. Collected Webster Falls on Verdigris River in morning. Visited Bacone college before lunch. Collected at Bayou Maumard and revisited localities one mile east of Oklahoma 10.

Aug. - 22 - Went back to locality 7-8 miles east and one mile south of Fort Gibson. Collected till noon-time. After lunch heavy rain drove us out. Went to Keough Co. north of Fort Gibson, 2 1/2 miles where it had not rained.

Aug - 23 - Went over to Okmulgee and collected at SW end of Lake Okmulgee and just west of Deep Fork west of the City. After lunch returned to Norman, to deliver Mr. Foster.

Aug 24 - Spent morning at Oklahoma Univ. with Sallicker. Had dinner with Mr. & Mrs. L. Then went to Arkansas City, Kans.

Aug. 25 - Collected all day north and south of Dexter, Kans. Derbyia was abundant in road cuts 3-3 1/2 miles NW of Dexter on Kans. 15 and on the same road in the E edge of the village.

Aug. 26 - Went to Fredonia but was refused admittance to the Quarry. Went back south to Caney and to locality north of Copan. Collected there all afternoon.

Aug. 27 - Left Independence. Accidentally discovered quarry in Checkerboard Limestone 1.8 mi. N of Lawpach, Okla. Collecting excellent!

Aug. 28 - Back to quarry north of Lenape for two hours. Then out to Nowata where I found nothing. Drove to Vinita. Collected Fayetteville north of US 60-66 about 5-6 miles east of Vinita.

Aug. 29 - Collected Fayetteville shale in bluff just south and west of Shawnee Creek in NE $\frac{1}{4}$ 11-25 N & 21 E all day. Collecting good particularly for large productids.

Aug. 30 - Collected 5 miles east of Vinita until 11 P.M. Then drove to Springfield, Missouri.

Aug. 31 - Springfield, Missouri to Henderson, Ky.

Sept. 1. - Drove to Corydon, visited Mr. Campbell for afternoon.

Sept. 2 - Corydon, Indiana - Parkersburg, West Virginia.

Sept. 3 - Parkersburg, W. Va - Washington, D.C.

✓ June 22.
 Breakfast ✓ 0.20
 Lunch ✓ 0.35
 Supper ✓ 1.00
 Visited locality 702 d and
 spent day at it.

✓ June 23.
 Out to mtn. front in morning
 Thrown off. Came home & finished
 packing because of rain.
 Breakfast ✓ 0.80
 Lunch ✓ 0.31
 Supper ✓ 0.85
 Gas 6.7 gals. (Marathon) ✓ 1.75

✓ June 24
 Haul boxes ✓ 2.00
 Telegram R.J. Stark ✓ 0.90
 Breakfast ✓ 0.70
 Lunch ✓ 0.50
 Supper ✓ 1.05
 Brought boxes to Station. Visited
 702 e and 706 e.

✓ June 25
 Freight 11 boxes, 6 blocks ✓ 110.80
 Laundry ✓ 1.22
 Breakfast ✓ 0.70
 Lunch ✓ 0.40
 Supper ✓ 0.90
 Bag for packing ✓ 0.70
 Gas 7.4 gals. Marathon ✓ 1.92
 Lodging 8 nights. Marathon ✓ 24.00

0124

June 26

Breakfast

✓ 1.10

Lunch

✓ 0.95

~~Supper~~

✓ 1.10

Gas San Angelo 12.1 gals. ✓ 2.78

Marathon to Cisco by 3 P.M.
 Collected Putnam ls. fossils
 2.3 miles W of Putnam on US 80.

June 27

Breakfast

✓ 0.60

Lunch

✓ 0.40

Supper

✓ 1.20

Gas 8 gals. ✓ 1.84

Collected loc. 1.2 mi. S. of
 Sinsight in morning. In after-
 noon went to Moran and
 collected what seems from Plummer
 + Moore map to be Moran fm.

1- 5 miles SE of Moran on US 283.

Small qtz. & roadside cut. In
 qtz shale below ls contained fossils.
 In rd cut shale above limestone
 very fossiliferous. Limestone 6-10'
 Thick

2- In field on S side of road
 exposures above a tank. Same
 ls. as qtz.

3. Road cuts on east side road
 11.7 mi. SE of Moran. Same
 limestone as Quarry?

Martin's lake S of Bridgeport

33.9

35.25 to Bank

W from Bridgeport

1) 5.25 Bank in Bridgeport

2) Texas 24 Junction Lake Bridgeport
5.9 Paved road

3) R. I. R. R. 6.2.

4) unpaved turnoff to Lake
Bridgeport Dam

9.4

5) sponge locality 9.6.

Road cut on paved road

9.6
5.25
4.35

See Scott on Wise county for
horizon at Martin's Lake. To find

excellent sponge locality leave bank
in Bridgeport, go to Texas 24.
Follow 24 to turn-off to Lake
Bridgeport. This is a paved road. Follow
this to junction of paved road with
unpaved road to Bridgeport Lake
Dam. 0.2 mile west of this junction
is road-cut with sponges part
way up hill. This is 4.35 miles from
bank in a NW direction.

June 28
Breakfast

✓ 0.70

nails

0.10

Lunch

✓ 0.60

Moore's loc. 88.9 is 5 miles E
of Cisco on US 80 and 860 paces
W of Ry. Old road mentioned by
Moore turns N about 100 yds
west of broad bend in US 80
5 mi. W. of Cisco. opposite
entrance to house on S. W of
Old road is 4.8 miles W of
Eastland courthouse

Supper

✓ 1.30

Hotel Cisco 2 nights, call

✓ 6.55

Freight 1 box Fort Worth

✓ 7.65

June 29 -

Breakfast

0.75

Gas Bridgeport, Texas

✓ 2.63

Room Fort Worth 7 nights

✓ 28.00

Send R. J. Starks Permian pictures.

~~Supper~~ Supper at Starks

~~1.35~~

June 30.

Breakfast

0.75

Supper

1.35

July 1 -

Breakfast

0.75

Supper

0.65

July 2 -
Breakfast

0.80

Supper

1.35

Collected in quarry W of Salerville

July 3. -

Breakfast

0.80

Supper

1.25

Tacks

0.06

Potato Hill, + Post Burger 6 mi. W of
Duchessboro.

July 4 -

Breakfast

1.00

Supper

2.50

E & W of junction Texas 199 + US 281

July 5 -

Breakfast

✓ 1.00

Gas 4 gallons

✓ 0.88

Freight 2 bags, 1 box

✓ 12.50

Lunch

✓ 0.57

Supper

✓ 1.37

Fort Worth to Sulphur, Okla
Visited White Mounds

July 6

Breakfast

✓ 0.77

Lunch

✓ 0.70

Supper

✓ 1.07

Syntrophopsis bed 160' below
top of Arbuckle, SW 1/4 NW 1/4 NW 1/4
22 + 15 - 1E, Murray Co., Okla
bed crosses ~~near~~ ^W line of
section 900' S of the NW corner

N. gen - Ham loc F93

Send Bill Ham copy of
Brachiopod ecology

0128

J=15' 2nd dam at Spring Creek

I=60

H=15 1/2

G=18'

F=23'

E=30'

D=35'

Platycephalus C=11'

B #33'

A
20'covered
shale

90

SS

coarse calcarenite upper surface
forming north wall of gorge just
below (east of dam). Saw large
Oxyplecia on upper surface
Heperorthis? 20'±. Camptelthis?

B- greenish dark fissile shale breaking down into thin flakes at very base *Encrinurus*, *Oxoplocia* common.

C. C¹- nodular, yellow weathering ls. with many bryozoa ca 30"
 C²- crumbly sh with several thin nodular lines as below
 C³ Fine *Compylortus*, numerous
 C² lower byella, rare *Glyptortus*,
 Fossifera, *Platycystites*. We
 can call this *Platycystite* zone
 Thickness ca 7'

C³ - bryozoan shale. upper bed of C² about 6" yellowish ls. Thickness 15".

Top of C² and C³ contain the coarse-ribbed *Multicostella* seen in green shale at base of section in Ciner Hills.

I think Division C is the same as the small collapse cut, about a mile S of Sulphur on Okla. 18.

D- D¹- 3 1/2 - 4' of cobbly, crumbly ls. with large *Opikina* but small *Strophomena*. Like basal Ciner.

D²- 31' alternating thin ls. (about 2") and thin shale beds (up to 6") with *Isotelus* (*Homotelus*?) and *Simulacra* in bottom, with big *Opikina* and *Oxoplocia* abundant at top, *Fossifera*

- E - E' - 9' Thin-bedded ls. at base
 mostly thin-bedded ls (2" - 4")
 with shalier zone at top
 upper part with many square
 Opikina & some fascifera
 Base of F on S bank 2nd arroyo.
- F - Light to dark gray weathering
 in beds 4-6" thick. Large strophomena
 Opikina. Strophomena abundant
 at top forming black lines because
 vertical to bedding. Top of F
 at edge of 3rd arroyo. NW edge of
 main dam.
- G - Thin bedded ls, little shalier in
 lower beds (2" - 4" thick). Yellow
 brown Camarocladia-like forms.
 Fossils abundant in section.
 Sowerbyella in swarms. Top is
 long dip slope in outlet arroyo
 from main dam.
- H - Thin-bedded ls & shale abounding
 in Sowerbyella, Neoperorthis &
 small Camylorthis.
- I - Thin-bedded elastic ls. containing
 brachiopods & countless bryozoa.
 Lo often, coquina of brachio or bryozo.
 Large Strophomena. Squarish Opikina
 Sowerbyella, plump smallish
 Camylorthis, Oxoplocia loose.
 Lower half smooth ls., upper
 half detrital ls. Lower half
 with brachiopod coquina. 60°
- J - Brownish dense massive
 dark gray weathering ls., brownish
 gray ls. Forms N slope outlet
 of main dam.

In section 1/4 mile W of
 by 77 The Sowerbyites occur in
 The upper 10' of Deekers division
 23 just under a sandy ls.
 Deekers beds 23, 22 and possibly
 21, I think, correlated with the
 shales on Spring Creek.

July 8

Offn

18'

M

30'

L

Section on US 99

all thicknesses questinates

A = limestone, calcarenite

8'

K

of bryozoa & cystid stems often sandy
 Hesperorthis, Mimella, large Opikina

3'

J

B = shale with Valcouria,

3'

I

Hesperorthis.

Covered

C = calcarenite trilobite fragments

D = shale 2' Bryozoa, Mimella

Hesperorthis

25'

H

E = yellow-weathering thin bedded
 ls. 8'

22'

G

F = yellow porous ls. 40'

Top 26' thin bedded blue but
 weathering yellow often shaly

40'

F

G = bryozoan bed consisting
 of 4 parts: 4' of bryozoan

Covered } 30'±?

Coquina with Mimella a;

8'

E

nodular ls 3' of crin

2'

D

lithology with abundant

3'

C

Opikina. Thin bedded ls. 5'

7' B

B

platy ls. & shale 10'

25'±

A

rough sandy appearing
 brown weathering

platy yellow white
 weathering sandy ls 10'

+25' to

Bridge of M. Lick

H. Blue massive, thick bed
ls. dipping to plates, contains
beds of calcarenite and most of
top is calcarenite 25'

I - light gray ls. 3'

J - calcarenite, shaly at base 3'

K - shaly & thin bedded ls. beds
up to 6" 8' contains one
3" bed of Crin like lithology
at top fossils poor.

L - mostly calcarenite 30' heavy bedded

M - shaly ls. massive 1' bed
at base, shaly & massive ls.
with thin beds of mealy light
gray ls. in a thin 8" mealy
bed 3' below top & just under
a 1' massive light gray bed
Crinostomyncha is abundant

July 7
Breakfast

1.00

Lunch

0.74

Shirts

2.25

Supper

1.22

Went to Spring Creek

July 8

Breakfast

0.87

Lunch

0.43

Supper

1.32

July 9

Breakfast

0.87

Lunch

0.77

Supper

1.07

Log for Pennsylvanian fossils

16.95

18.1 Road intersection

19.15 blind intersection, turn SE

19.5 Washita River

20.8 turn S.

21.5 " E

23.5 Washita River

26.9 Mill Creek

28.3 Okla. 12

30.7 center of Ravine

July 10.

Breakfast

1.02

Lunch

Supper

Laundry

✓ 1.25

July 9.

Myers

4 miles east of Hynepin
 1000' due east of ~~the~~ house
 Center SW $\frac{1}{4}$ 2 - 15 - 1W. Locality
 for *Dipaulasma typicum*.
 Probably topotypes. Rocks
 much distorted. I think possibly
 algal reefs. Only place here and
 just outside corral that we
 saw these fossils. About 0.15
 mile on strike of beds from corral.
 All blocks marked here.

Mountain Lake

E $\frac{1}{2}$ 22 - 25 - 1W, Carter Co.
 Near dam on edge of lake, southwest
 side about 12' under upper edge
 of brownish with *Receptaculites* occur
Rosticellula, *Strophomena*, a and
Bygonia suggesting *Criner*. At west
 end of lake and along shore
 to SE for some 200 yds occur
 green sh with *Multicostella* +
Platycystites, same bed as Spring
 Creek.

Spring Creek revisited

Basal bed 85 - Dr. B.

Paced section = 118'

1 = Brownish sand

2A = 25-30' probably shale but
also thin bedded ls.

2B = Sowerbyites bed - 2 1/2' ±
shale & thin-bedded ls. with
Sowerbyites, Minella, large Opikina

2C - brown ls. 3'

A 2D - green shale with small
Valcourea - 17'

42' 2E - ls. 2' Small Multicostella
placed in sack with 2D.

16' 2F - mostly green shale
with thin nodular ls. Middle
5' abundant in stiele-like byozoa

2' 2G - 4' heavy ls. at base
Shale with nodules of
lime 8' followed by 2' ls.
Following is 2' of shale
Remainder covered,
probably shale

25' 2A

A = calcarenite 15-20'
corresponding to previous
section.

Notes

Trip to SW with

E. Yochelson

May 31 - July 31

1947

0114

✓ May 22

Purchase \$700 in Travellers cheques

✓ 5.25

Cheque nos. A50,792,504 - A50,792,538 = 10

B43,545,322 - B43,545,341 = 20

✓ May 28 - 14 gals. gas, Washington, DC. ✓ 3.24

May 31 - Lexington, Va 12 gals., oil ✓ 3.46

Abingdon Va 9 3/4 " ✓ 2.45

Lunch, Lexington, Va ✓ 0.50

Supper, Morristown, Tenn ✓ 0.90

Morristown overnight

✓ June 1 Breakfast, Morristown ✓ 0.50

Room, Morristown, Tenn ✓ 3.00

Gas Rockwood, Tenn. 12.4 ✓ 3.48

Gas Waynesboro, Tenn 13.5 ✓ 3.73

Lunch Murfreesboro ✓ 0.46

Supper Memphis ✓ 0.50

Room, Memphis, Tenn ✓ 4.00

Service car ✓ 4.96

Memphis overnight

✓ June 2

Gas Little Rock 9.8 ✓ 2.65

Breakfast & Memphis ✓ 0.61

Lunch Arkadelphia ✓ 0.46

Supper, Dallas ✓ 0.90

Gas, Texarkana 5.6 ✓ 1.40

Room Dallas, Texas ✓ 4.00

Dallas overnight

✓ June 3

Breakfast & Lunch 0.65 ✓ 0.54

Gas Fort Worth 13.4 ✓ 3.87

Gas & oil Anson, Texas 9.8 ✓ 2.69

Phone call ✓ 0.90

Gas Hobbs 10 ✓ 2.64

✓ Arrived Carlsbad 5:30 P.M.

✓ June 4

Gas 11.4 oil Mayhill ✓ 3.30

Lunch Alamogordo ✓ 0.97

Supper ✓ 1.10

36 43

✓ June 4 cont'd
 Lodging 4 nights Alamogordo ✓14.00
 Left Escondido 8:00 A.M., arrived
 Alamogordo at 11:30 A.M.

Afternoon collected Sly Gap
 and Caballero in Canyon 3 miles
 due east of school for blind on
 Nedge of Alamogordo. Road goes
 due east to mouth of canyon.

✓ June 5
 Breakfast ✓0.70
 Supper ✓1.00

Collected Devonian and Mississippian
 on saddle between Marble Canyon
 and first branch south.

✓ June 6
 Breakfast ✓0.95
 Lunch ✓0.90
 Supper ✓1.10
 Unsuccessful attempt to get to Capitol Parks

✓ June 7
 Grease car, repair motor ✓7.05
 Breakfast ✓0.75
 Lunch ✓0.71
 Supper ✓1.10

Went over to Sly Gap.

✓ June 8
 Breakfast ✓0.71
 Gas Denning, N. Mex. ✓2.43
 Lunch ✓0.71
 Supper ✓1.71

June 9

Breakfast
 Tire repair
 Lunch
 Water bag
 Supper

✓ 0.72
 ✓ 0.61
 ✓ 0.72
 ✓ 1.79
 ✓ 1.27

Spent day 4 miles east of Santa Rita and $\frac{1}{4}$ to $\frac{3}{4}$ mile N of road. Exposures north of ones collected in 1946 have few fossils.

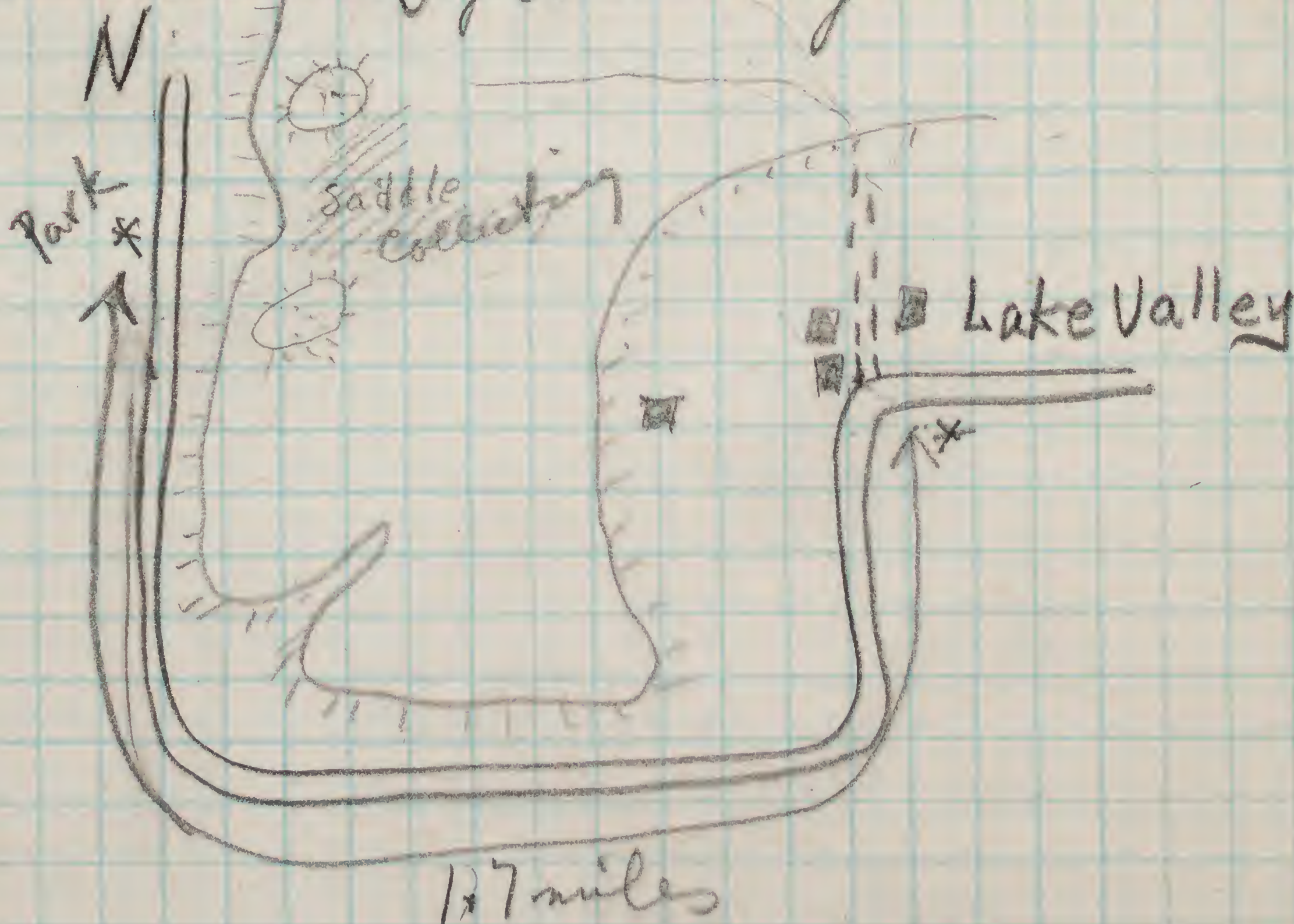
June 10

Breakfast
 Gas 18.2 Silver City
 Lunch
 Supper

0.66
 ✓ 2.81
 0.47
 1.70

93

Lake Valley - locality 1.7 miles by road N of Lake Valley.



✓ June 11.

Breakfast

✓ 0.71

Lunch

0.36

Supper

Sub 12.4 Silver City

✓ 3.42

Freight one box

✓ 6.30

Supper

✓ 1.70

Room 6/8 thru 6/11

✓ 10.20

Revisited Georgetown, Collected
 Gospel Lake Valley on N side Canyon
 at about point where massive
 layers plunge under Canyon
 floor. Sent off one box from
 Silver City consisting of Rev. + Miss.

✓ June 12

Breakfast

✓ 0.66

Room Douglas 2 nights

✓ 5.00

Lunch

✓ 0.60

Supper

✓ 1.60

Rasp, hammer handle, 2 chisels

✓ 2.10

Found small hillcock east
 of Blanca without trouble.
 It is about 0.1-0.2 mile east
 of U.S. 80. It is 12.7 miles by road
 west of Douglas underpass on
 west side of town. Locality 0.4
 miles from N end largest knob.

✓ June 13
 Breakfast ✓ 0.70
 Lunch ✓ 0.35
 Supper ✓ 1.50
 Wheel change ✓ 0.30

Visited hill 12.7 miles N 75° W
 of Douglas smelter and
 collected there all day.

✓ June 14
 Breakfast 0.75
 Lunch 0.86
 Supper 1.75
 Sale Bibbe 12.1 ✓ 3.28
 Ship 2 boxes ✓ 16.66
 Rivet rucksack ✓ 0.25
 Room, Douglas 1 night ✓ 2.50

Brachiopods occur in north hill
 and north end of next hill south
 They seem to be confined to a zone
 of organic (now silicified) sand in
 a blue gray matrix. This zone
 occurs along the east face of the
 hill just above the talus. Brachio.
 also appear just under the sandy
 zone. Sandy zone contains crescent
 shaped plicated oysters, small radiata
 and occasional echinoids. Brachio. range
 for 20 feet above "sandy" bed and 5^{1/2}
 feet below it making a total
 range of 25 feet. Sandy zone
 well displayed in long sloping
 north end of north hill where
 limestone descends below the plain.
 Brachio. uncommon at north end
 of hill.

Brachio. are most numerous
 at the saddle between the north
 hill and the one next south

Check

June 11 ✓
 Wire \$1.00

which exposes higher beds except along the NE face where some brachiopods may be found. At the saddle the brachs range for about 25-20' vertically. Here the beds above the sandy layers are a mass of corals, sponges and algae with a few pelecypods scattered among them. In these upper beds the brachids are less numerous than below. The sandy beds occupy the most of the saddle and contain some brachs but just under the sandy beds are brachenal beds abounding brachs, beds some 5' thick. This is a total range of brachs of about 20-25'.

Traveller's cheques to June 15.

\$10⁰⁰

A 50,792,584
 " 50 5
 " 50 6
 " 50 7
 " 50 8
 " 50 9
 " 510
 " 511
 " 512
 " 513

\$20

B 43,545,322
 " 23
 " 24
 " 25
 " 26

June 15	
Breakfast	✓ 0.75
Lunch	✓ 0.60
Supper	✓ 1.00
Gas Deming 8.16	✓ 2.32
Service car, gas 6.9 gals. El Paso	✓ 4.86

Moved from Douglas, Ariz to El Paso.

June 16.	
Remember Bill Strain to Al.	
Breakfast	0.75
Lunch	1.05
Supper	1.00
Spent morning at El Paso with L.A. Nelson. Afternoon collecting?	

June 17.	
Breakfast	} 1.25
Lunch	
Lodging 3 nights El Paso	10.50

June 18	
Breakfast	✓ 0.75
Lunch	✓ 0.90
Supper	✓ 1.25
Gas 9 gals. Van Horn	✓ 2.34
Purchase generator	✓ 25.00
Rock hammer + handle	✓ 2.50
Packing supplies	✓ 6.27
Laundry	✓ 2.07

New generator put on in El Paso

✓ June 19
 Breakfast 0.80
 Lunch 0.75
 Supper 1.25

Threatened rain all day. Morning worked on weed mtns. in 7500 ft. Collecting and results poor. Afternoon collected 702C. Took about 12 blocks.

Box 1 - 702C 7 blocks?

Box 2 - 702C 4 " "

✓ June 20
 Breakfast ✓ 0.80
 Lunch ✓ 0.25
 Supper ✓ 0.90
 Telegram to A.R. Loeblich ✓ 0.98
 Gas 8.3 gals. Marathon ✓ 2.15

Collected at Split Fork all morning and at Word Ranch (703D) in afternoon. Packed 3 boxes.

Boxes 3-5. Contain 2 block 702C, all of but 1 of 702(un), all 702 ent and some 703D.

7026 must be changed to 0.3-0.4 miles east of Split Fork on south side of road.

✓ June 21
 Breakfast 0.80
 Lunch 0.40
 Supper 1.25
~~Gas~~

Worked 0.4 mile east of Split Fork and at Word Ranch. Packed 4 boxes.

0122

Burpees from Marathon
Box

	54
1	281
2	221
3	266
4	259
5	319
6	192
7	244
8	248
9	220
10	250
11	259

11) 2759 259.
22
55
55
9

12 (Black)	83
13. Block	180
14 Block	100
15 Block	105
16 Block	108
17 Block	192

2759

3022

768

768

3527

Topmost beds
Spring Creek

15'

Hard massive with square
Opikina & Receptaculites

33'

Bryozoan coquina

13'

I
Platy ls. crowded with
Strophomena.

44'

H
+
G

Shaly platy ls with Strophomena
Campylodictya, Hesperotina
Base shaly beds with Hesperotina
Massive ledges forming dip slope
on N side main dome contain
Recept., Sowerbyella, Campylodictya
obesa.

0137

July 10 cont'd

Supper \checkmark 1.12
 Express boxes from Washington \checkmark 11.76
 Nails \checkmark 0.75
 Gas 8.6 gals. \checkmark 2.14

Plectotrophia ~~748~~ 748-2N-12W.

Comanche County, Oklahoma
 15' above base of Fort Hill (Stratigraphically)
 just above Chirocephalus zone.

Send Fredericksen blocks of Plectotrophia
 limestone.

Wetumka NW $\frac{1}{4}$ NE $\frac{1}{4}$ 18-3N-7E
 go to Ahlozo, $1\frac{3}{4}$ mi E on sect. line
 just N

Penn. loc. NE $\frac{1}{4}$ SW $\frac{1}{4}$ 32-35-4E,

Johnston Co. Okla. roughly
 10 miles WNW of Ravia.

July 9th.

✓ July 11.

Breakfast

72914

✓ 1.02

Lunch

✓ 0.79

Supper

✓ 1.12

Write proposition of exchange
to L. A. NelsonWe turn Ka shale 1.95 Miles
E of OK/2 Homa 3, Between
005 and 01 Miles E of PipelineGas 10.7 gals 1 qt oil
72971

✓ 2.77

✓ July 12

Breakfast

Lunch

Supper

0
1/2
1/2240
214
226

680

✓ 0.87

✓ 0.45

Supper

Freight 3 boxes

✓ 1.83
✓ 23.81

July 13.

Breakfast

Lunch

Supper

Hotel 9 nights Sulphur

✓ 0.97

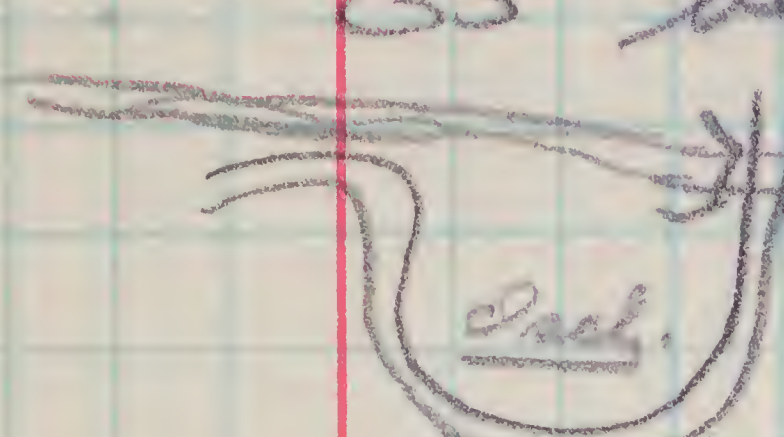
✓ 0.74

✓ 1.12

✓ 27.54

July 13 Rock Crossing

Reference point in Deckers section is Aschadites bed which occurs on inside of loop of stream and only bed there. It is about 30-35' below Multicostella. Below

 Multicostella The beds are predominantly siltstone, often very thin bedded, ss and calcareous ss on siltstone. Fossils occur in this sequence but are not common and

Deckers zones

1 = 14 paces, zone 2 = 19, zone 3 = 43, zone 4 = 11

Zone 1 - contains Valcourea magna, Wide hinged Opikina minnesotensis, large Strophomena. I saw no Dalmanites in this zone. Sowerbyella is common.

Zone 2 - This contains Oxoplectra, Hesperorthus and Dalmanites. I think these two zones (1+2) could be combined into one zone.

Zone 3 - Contains mostly trilobite fragments particularly Leptodomas which is abundant in lower part.

~~Zone 4~~

Zone 4 - Base of this zone contains the small *Strophomena* also seen above *Multicostella* at Spring Creek. It is composed of beds of calcarenite and rough appearing limestone alternating with crin type of calcilutite.

Ham F 564 -

1900' E ~~of~~ and 1600' N of

SW cor 30-15-1W, ~~Sec 10~~

Murray Co., Okla.

Mid. West Spring Creek

July 14

Breakfast		✓ 1.07
Gas Ponca City	11.9	✓ 2.98
Lunch		0.47
Supper		0.97
Service car, pack front wheels gas 8 gal		✓ 6.82
Freight one box Arkansas City		✓ 7.69

July 15

Breakfast		✓ 0.56
Lunch		✓ 0.61
Supper		✓ 0.50
Gas: Ottawa, Kans	12.3	✓ 2.88
Lodging Coffeyville		✓ 6.00

July 16 -

Breakfast		0.66
Lunch		0.44
Send R.C. M. Dietzendorf		
Wellen		

July 17.

Breakfast		✓ 0.66
Lunch		✓ 0.49
Paraffin 6 pounds.		✓ 0.92
Supper		✓ 0.69
Freight one box (Lawrence)		✓ 5.64

June 18

Breakfast
Lunch
Supper

✓ 0.80

✓ 0.52

✓ 0.77

July 19.
Breakfast
Lunch
Supper
Saturday

0.74

0.56

1.89

0.59

✓ 1.26

July 20.
Breakfast
Lunch
Supper

0.66

0.46

3.02

1.90

July 21
Breakfast
Lunch
Supper

0.50

1.91

0.72

0.69

July 22
Breakfast
Lunch
Supper

0.56

0.57

0.61

North American Hotel

July 23
Breakfast
Hotel 8 nights Lawrence
Gas Ottawa 7.8 gals.
Lunch "
Supper
Lodging, Jeff City2.96
62
5.62

0.66

✓ 24.00

✓ 1.84

0.56

2.40

3.83

July 21

1.0 mi. E & 0.9 mi. W of Eudora

Stoner ls. (Echinocochus)
 Eudora gray & blk shale
 Captain Creek ls. with Euteleia

Bonner Sprs.

Plattsburg ls.
 Wyandotte ls. with pellet (4')
 bed containing mollusks.

Argentine
 (Frasie member) Wyandotte

"Dola"
 Linc sh

West Muncie Bluffs W of KC

Raytown
 Muncie Creek sh. } Dola
 Paola ls

~~Muncie~~ Charmite shale

Dunn (Cement City member)

~~Westerville~~ sh Aniversa sh.

Westerville ls.

Fontana sh

July 29.

Breakfast

0.55

Lunch

0.65

Gas.

Tip.

0.25

Bridge Toll Wheeling, W Va

0.25

Supper

2.00

July 30.

Sly Gap (Type locality)
 Log from windmill in
 Sly gap to Rhodes pass road
 (N. Mex. 52)

Windmill in Gap. 94.6

fork to Greer Ranch 97.0

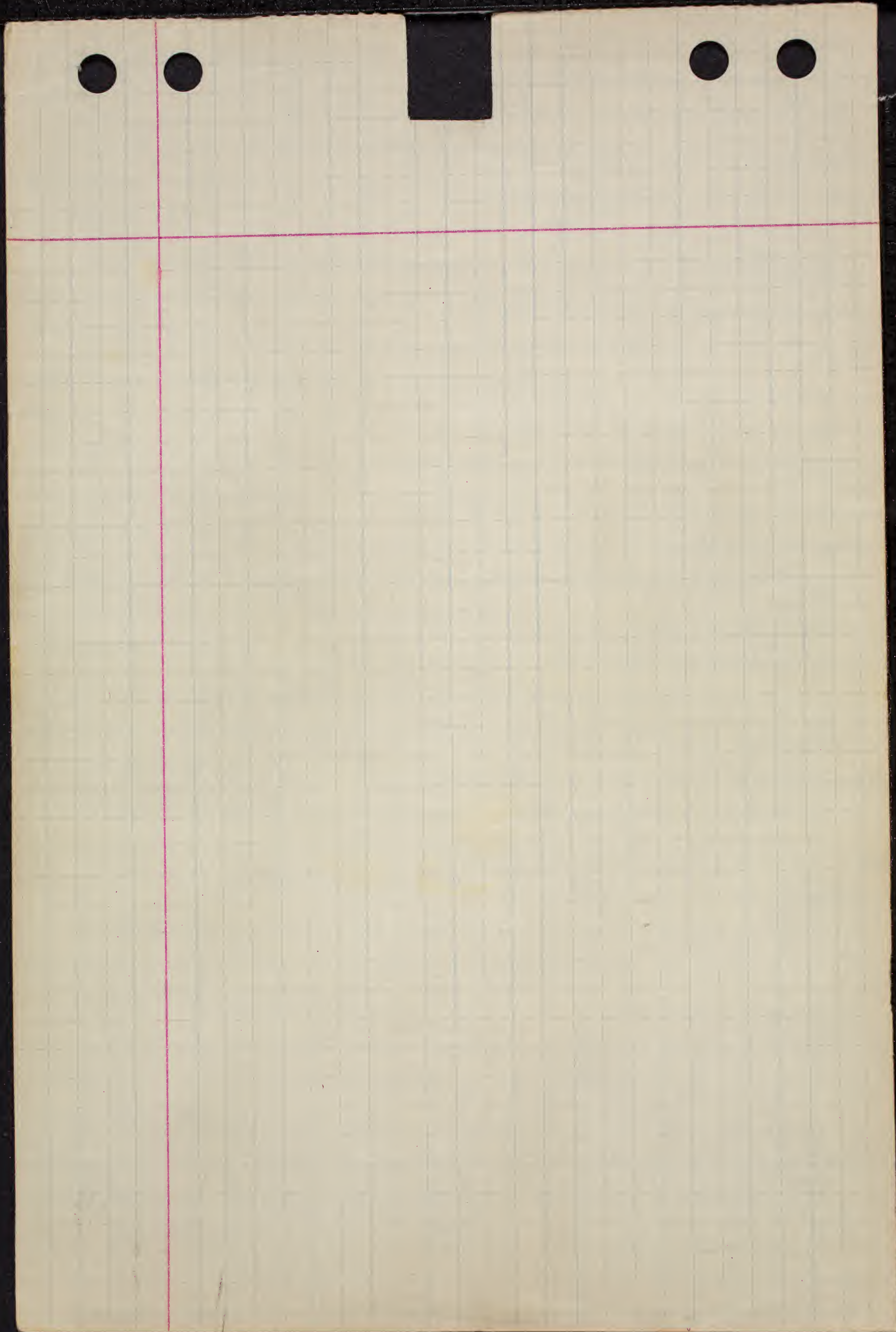
to N-S road 99.0

South to Benchmark 4118 at

Jackson Ranch 103.3.

Jackson Ranch to Rhodes

Pass (N. Mex Hy 52) junction 110.0



1952

SM 672 for ticket
 SM 673 for Pullman
 Mr. Weergaard

July 9

Arrived Tulsa, Okla. Wednesday morning 8:30 A.M. Left Tulsa for Adair, Okla about 10:00 A.M.

on Okla 28

Collected east of Adair in Fayetteville shale. Locality reached by going 4.3 miles east of Adair, then turning south. Follow road south for 2 miles to first cross-road. Go east about one mile. Walk south-southeast $\frac{1}{4}$ mile to lost scrap. Collecting along east and south faces. This puts the locality in the N $\frac{1}{2}$ of section 7-T22N, R20E. Check on road map.

July 10

Went out east of Muskogee for day. Collected east of Fat Gibson in the Mayss. Go east on US 62 for $6\frac{1}{2}$ miles and turn south in middle of section 12 and follow road

②

Chuck

to sharp bend just over bridge, from bend road goes east for about one mile to collecting place which is where road starts up hill. This puts the locality just on the north side of the section line opposite the Muskogee-Cherokee County line in Cherokee County. Bowsher gives locality as NE $\frac{1}{4}$ NW $\frac{1}{4}$ 18-15 N-21 E. The locality should be near line between sections 7 and 18-15 N-21 E.

July 12

In morning collected a few minutes about 2.3 miles west of Putnam on Knob of Putnam formation. New U.S. Hwy 80 runs on south side of Knobs.

at Baird walked railroad from 1-2 miles NW of Baird looking for Permian fossils. Found very few.

Went south to Ballinger to collect in R. C. Moore's Colorado River area. Went first to 9843 east of the Colorado River. Here about $\frac{1}{2}$ mile down a small

(3)

Creek a section of 20-30' appears in a bend of the creek. At the base Meekella inexplicata is abundant in a single band about a foot thick. It is accompanied by a dictyoelostid of moderate size. In the limestone a few feet above Meekella the dictyoelostid is larger than below and may be another species. In the uppermost exposed limestone nearer the head of the creek the dictyoelostids are silicified.

Moore's locality 9857 is on the roadside on top of the river bluff. Here limy shale and limestone contain large dictyoelostid in abundance, many of them with the ears and both valves clear. Along with the dictyoelostid occurs a Heteralosia-like brachiopod. Little else besides Myalina was seen.

(4)

738

July 14 - Flat in morning. Went to call on Mr. Wallace Pratt, then went to mouth of McKittrick Canyon to collect Laramie ls. Collecting place about 0.3 mile N 80° E of section Twelve well just east of entrance to McKittrick Canyon. Took 9 blocks. Laramie here is platy dark limestone. The fossils occur in lenticular swellings of the limestone.

July 15

732

First locality Getaway ls just south of road 1/2 mile west of bend at elevation 5316. ^{Got} ~~Noted~~ by 1552

Newell
512

Second locality base of limestone ca 0.4 mile S of road and about 1/2 mile west of road bend at 5316. Just S of last S in Guadalupe Pass. ^{Got} by 1552 F2

733

July 1552 F3 - Hegler Ranch. About 1/4 mile S 55° W of ranch house up small canyon. Newell 398

F4 July 1552 Mid Pinery about 1/2 mile S of Hegler Ranch

⑤. F5 Jy 1552 about 100 yds S.
735 of F3 Jy 1552

736 F6 Jy 1552 About one mile N
of Hegler Ranch. Pinery

July 16

737a Went to Big Canyon. Collected
Crack-out Capital with many
Synammulania and Martinia on
spur on north side of canyon
about 1000 feet above canyon.

737

Left hill about 12:30 and went
into mouth of canyon and took
5 blocks out of massive Lamar
limestone.

Blocks

Lamar McKittick	9
Gateway Newell 512	12
" Jy 1552	2
Hegler Ranch Mid Pinery	4
" " Pinery F6	4
Big Canyon Lamar Jy 16	5
	<hr/> 36

Locality for Crackout Lamar —

My collection from McKittick Canyon
is Rader

Includes
2 blocks
from loc 600 =
Jy 1552

0408

Jy 16 - North side Big Canyon
about 6100' elevation on southeast
spur of Lonesome Ridge,
Carlsbad Caverns West \square , N. Mex - Texas.

Jy 16 blocks about $\frac{1}{4}$ mile
from mouth of Big Canyon
on northeast side, Carlsbad
Caverns West \square , N. Mex - Texas.

July 17

Shipped 2680 pounds from
Carlsbad.

July 21

Met Madeline Caraway
in Hillsboro.

July 22

Mud Springs Notes.

Pennsylvanian

5'±

cobble ls. with Pennsylvanian fossils

5'±

Bright green shale

greenish shale with small

40-
45'nodules and nodular layers in
bands. *Nerostrophia*, *Flumascaria*

20'

Yellow to brown weathering nodular shale
Abundant scattered *Atrypa*, *Schizophoria*
and *Leiorhynchus*.

15'

Yellow-weathering nodular shale
with large *Atrypa* and many
crinoid stems. Fossils numerous
Sphaerosporgia at top.

Silurian

July 23.

Went 4 miles east of Derry, N.M. on good road up to Flouite mines in Caballo Mtns. Mines called Macky-A, owned by a Mr. Lucini.

About $\frac{1}{2}$ mile E of mines and at base of hills in washes in the fan were seen some 20-30' of gray shale weathering red or yellow and abounding in fossils. *Martinia* is common but a large *Atrypa* was abundant. Below this, yellow shales contained large *Schizophoria*. The fossils, except for *Martinia*, reminded me of the lower 25-30' of beds seen in Mud Springs Mtns.

At the mines some Devonian shale was thrown out. This produced large *Martinia* and *Atrypa* but also *Hypothyridina*. The beds seem clearly to be Big Hays.

July 25

Collected Sly Gap in Chaudian
Wells Canyon. Looked for small
Gypidula which occurs about
15' above base at first exposure
seen. It occurs in a thin
yellowish hard band about
one foot below a triple or
double tier of hard beds. It
occurs with *Phomassina* and
Acutatheca

July 25

Visited Canyon of Horse Camp reached 18 miles S of Alamogordo, 7 miles S of Valmont, then go east about 13 miles to Horse Camp. About 3 miles ENE of Horse Camp in arroyo just W of road and about 20-40' below also contact is ledge of limestone abounding in small brachiopods particularly *Cryptacanthia* (or *Glossothyris*). This would be about the highest Pennsylvanian in this canyon although green also-type sandstone occurs about 50' below the fossil ledge. Just above the *Cryptacanthia* ledge occurs a layer abounding in *Kozlowskia*. Just about 1/2 mile west of the Horse Camp is a knob with a prominent ledge of limestone containing abundant snails and some productids, the latter mostly crushed.

Jy 25'

Pictures

- 1-3 - Guadalupe
- 4 - Percha at Bear Mtn.
- 5 - Indian Wells Canyon from City
- 6 - Indian Wells Reef
- 7 - Indian Wells Reef
- 8 - Indian Wells Devonian
- 9 - Indian Wells Devonian
- 10 - *Cryptacanthia* ledge
- 11 - Dev. Rhodes Pass
- 12 - Salinas Peak, San Andres Mtns.

Air Provost Marshall who gave permission to go to Rhodes Pass is Major William F. Haymon. Cooper write, Holloman Air Base, Alamogordo, N. Mex. Thank Haymon on behalf of Bowsher, Allen & self.

Captain Bernard M. Haymon, Base Supply Officer, Holloman Air Base. Thank for services in crating fossils to Washington. Include personnel.

See Hulbert, Okla. D., 15' sheet for localities for Mayes & Fayetteville east of Fort Gibson, Okla.

2nd Roll -

1. Derbyia bed 3.1 miles S. of Dexter, Kans.

From Ponca City to Kansas, 3.1 miles S of Dexter new cut on Kans. Hwy 15, 3.1 miles south of Dexter. Derbyias occur just above red shales. Wenton US 160 east from Burden to Grenola. 1 1/4 mi E of Burden RR cut & by cut with Derbyia abundant. No collecting between Burden & Cambridge. 6.1 miles E of Cambridge cut at top of hill overlooking a wide valley. Here pelecypods were common. On both sides of highway at 6.3 miles E of Cambridge shales contain large Dictyoelostus, Murchella etc. This locality is 0.1 mile west of the Cowley - Elk Co. line. One mile East of the County line occurred a cut on the US 160 abounding in this productus. 2 miles E of the County line another cut contains abundant Crinoid stems. Collected on Cowley - Elk

August 1.

Qy. $\frac{1}{2}$ mile NE of Burbank. Collection made in south end of quarry located on south arroyo leading into Salt Creek. The quarry in which we collected is about 0.4 mile south of U.S. 60. This puts quarry in SW $\frac{1}{4}$ SE 25-26 N-5 E. Label should be corrected. The horizon seems to be Red Eagle ls. which is thicker than hitherto believed.

Collected on Santa Fe RR, 2 miles NW of Fairfax in SW $\frac{1}{4}$ NE 2-24 N-5 E. Here shale is overlain by 3 ledges of limestone abounding in *Musulines*. The shales abound in fossils, *Spirifer* being very abundant. This section is probably Foraker also.

1979
8950

May 2

Left Washington by train to join J. Bridgman in Bristol, Va. Drove to Knoxville on same evening.

May 3.

Drove from Knoxville to Chattanooga. Saw Fort Payne, Chester limestones and Pennsylvanian on north nose of Lookout Mtn. at Chattanooga. Took U.S. 11 to Birmingham. Just W. of Chattanooga on W side Lookout Mtn. under RR bridge saw Chattanooga, then Silurian, Richmond, and Trenton. Trenton & Richmond shows all on down the Georgia strip of Hy 11. According to Mr. Butts an excellent section up to the Silurian is exposed NW. of Collinsville, Alabama.

May 4

Stopped on U.S. Hy 31 at crossing with Cahaba ^{Valley} Creek, 3 mi N. of Pelham, NW 1/4 6-20S-2W, outcrop of Newala ls. blue gray weathering, sub-lithographic. Crinoids under bridge, large cephalo with central siphonule, *Polyechia*, and *Prophylla*, *Coriobolus*.

0.2 mile south of Pratt Ferry where old road turns off west from new road above Lenoir occurs 10-12' Whitesburg. Lower 5-10'

479

consists of granular brown limestone with many fossils, in beds 1" - 4" thick. Upper 2 to 4 feet or perhaps more consists of smooth dark gray bituminous limestone with similar fossils as those below. These & upper limestones interfinger with the Athens overlying it. Athens has many graptolites. Good place to collect them.

The Seneca limestone is exposed from the bridge over Cahaba River up the hill for a little less than 0.2 mile.

152 paces down road ^{from Whitesburg} Christiania was taken in loose block of Seneca. Probably not far out of place. Seneca N 68° E 25° - 30° S E. Dip & strike taken at Christiania boulder. This genus must be about 100' below Whitesburg.

Under bridge at six mile is good outcrop of Ketona dolomite light gray dark weathering, and massive.

The fine-grained limestone at top of Athens is exposed for 1800' along road to west.

May 5

Saw Conasauga and Brierfield in
Montevallo and along creek
flowing through town.

On Ala. Hg. 25, near ^{3/4 mi. E. of} Newala P.O. on
NE 1/4 5, 24N-13E road and RR cut in Athens shale.
Going east from Montevallo passed
through S then first bluff was
~~Chapin~~ Copper Ridge. Thin
Canadian limestone + chert. 500
feet of Lenoir are ~~exposed~~ present
but not well exposed. Athens black
shale with many graptolites overlain
by about 15"-18" of Floyd Mt. ss. The
ss is overlain by Fort Payne chert
ss. dips about east. 8°. Mr. Butts
thinks the ss. may be Onondaga.

At Calera turned N on U.S. 31.

Lenoir exposed west of road across
RR. at Alabaster. Athens occurs
in ditch just over RR. and Little
Oak appears above the Athens in
ridge east of the highway.

Just S of road to west Floyd sh
is exposed on RR track.

Just S of turn to west in
Alabaster and on east side of
U.S. 31 occurs a large cut in
the Athens shale.

At RR bridge in S. edge of
Piketon excellent locality of
Little Oak. Bluish banded ls.

with thin bands of chert and
modules of chert. Fort Payne
Chert overlies the Little Oak.

480 In field about $\frac{1}{2}$ mile North
of this R.R. bridge and on west side
of Hy 31, on a knoll about 100 yds
west of Hy. occur loose Little Oak
fossils. Little Oak fossils occur in
much of the debris washed down from
the slope of the ridge.

481 About $\frac{1}{2}$ mile south of Cahaba
Valley Creek is a large quarry in
the Little Oak. Here it is hard
bluish, very massive limestone with
thin layers of chert. Fossils occur
in the debris stripped from the
limestone. The *Blunaria butsi* is
abundant in a zone about 10' thick
which occurs about 30 feet below
the top of the Little Oak.

482 Bridge fork, ^{ridge of} Newala cephalopod
250-300 feet below top of Newala. This
is also horizon of *Polytolochia fillistriata*

Along R.R. east of Leeds
where the line of Georgia Central
crosses US 78 is a cut showing
Frog Mtn ss., 3' of Chattanooga
attached to red shale and overlain
by Fort Payne chert. In ridge
to north the Little Oak under-
lies the Fort Payne

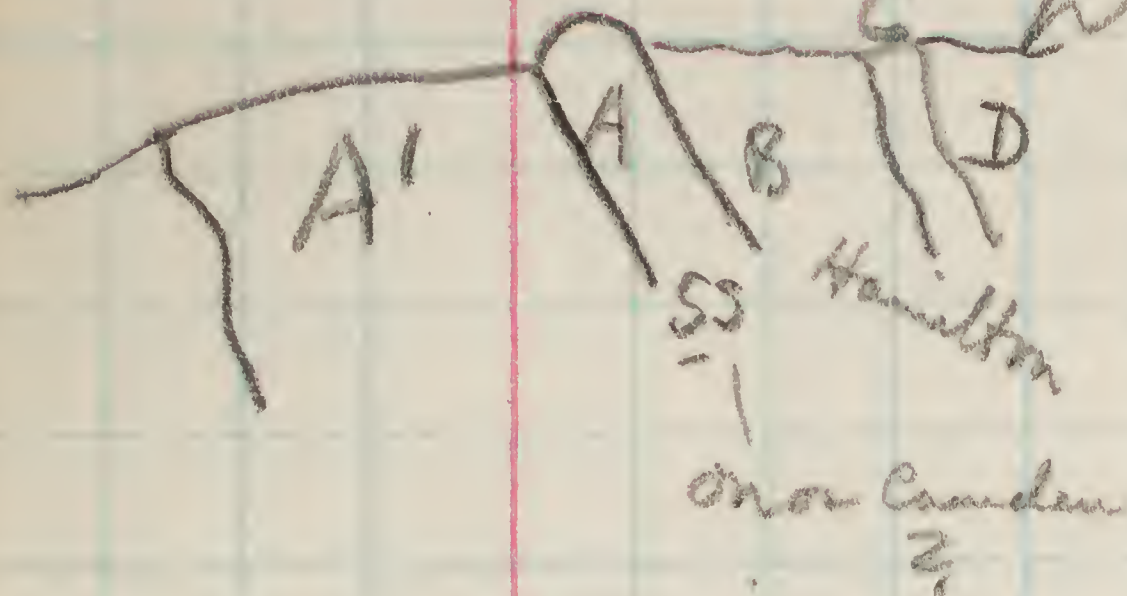
0572

5

May 6.
Cox Gap.

N 35 E 55 SE

Devonian



A - about 3' hard blue gray ss.

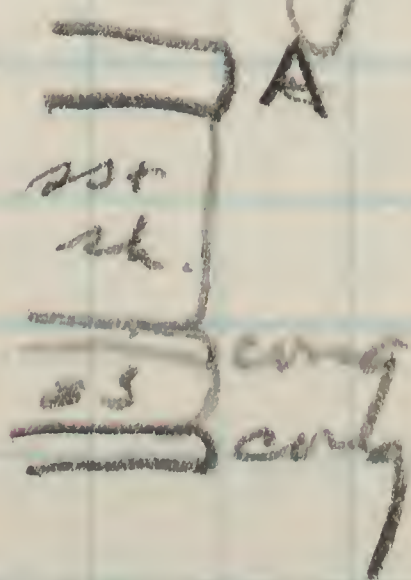
B - 25 feet long in outcrop (20') sandy dark greenish very fine grained shaly weathering ss.

C. 2 1/2 - 3' of Chattanooga shale.

D - Fort Payne (New Providence)

B. Lower half of B breaks into fine grained dark shaly rock upper half sandier with heavier sandy beds about a foot thick. Upper half contained *Tropidoleptus*. Hamilton dips N 35 E 55 SE

A' = 14 paces alternating sandy shale & ss in thin beds up to 3" for the ss. At base is 12" of hard coarse conglomeratic ss, followed by 2 1/2' soft ss then another foot of conglomerate



At top just under A occur *Orthis flabellites* and other Silurian fossils

First trip in morning went
 1/2 mile east of Odenville to old
 borrow pit on north side of R.R.
 The fossils were taken from upper
 Odenville.

Fort Payne

Rogland Qy. 1 1/2 mi. SE of Rogland

A - Little Oak

B - 8"-1' limestone welded to
 Little Oak.

C. Sandy crumbly shale
 about 3'.

D. - Soft sandy ~~rock~~ with
 many corals. 1'

E. 3" with Anoplotheca ^{with C. coronatus}

F. harder and with Tridoleptus occurs also below
 the Anoplotheca. Above

Anoplotheca sandstone because

F. harder and with Tridoleptus
 very abundant in the lower 5'

Fossils rare above

38'

35'

E
 D
 C
 B
 A



Miner
 Boarding
 House

May 7

Drove from Fayette NW to Catlet Gap up through Knox, Chicamunga, Richmond and Red Mountain (Clinton) Divide is made up of Silurian with thin Clintonorga not far above the road. NW of gap we went down through the section onto type Chicamunga which consists of Trenton, Lowville, Lebanon with Pionodemas, underlain by a thin equivalent of Lenoir. Here a fine-grained dark limestone with black rosey chert. The Lenoir is underlain by Mosheim a gray lithographic limestone. The Mosheim is underlain by Murphreesboro here fine-grained thin bedded dark limestone weathering to light gray. Lower Murphreesboro is well exposed on bank of Chicamunga Creek. Contains a large Goniatites, and many large, smooth ostracods. Knox occurs on opposite side of Creek at Pond Spring School house Avondale Stone Co. Ky.

Saw quarries in Lowville in East Clintonorga. Lowville dark buff ls., heavily bedded weathering purplish gray. Near top $2\frac{1}{2}'$ or more of bentonite. Ls. just under bentonite is altered to chert $2''$ thick. Fossils under bentonite. Some surfaces undercracked, ripple-marked. A second bentonite occurs near top of hill.

Quarry on Wilson Ave.

490

Collected from top of Lebanon
southeast of Chiconmanga, Ga.
Modular, thin-bedded ls
separated by beds of shale
abounding in bryozoa.

Rafinesquina, Multicostella, Minella,
Fusifera, Strophomena.

May 8

Term. 113 over Signal Mtn. shows beautiful section on west side Walden ridge. The section consists of Portsville, Pennington, Chester limestones, Fort Payne chert, 3' of Maury shale, 15 feet of Chattanooga shale, Brassfield and Richmond. These exposures are about 5 mi. S of Dunlap. The same sequence occurs on the west slope of the same ridge SE of Pikeville up the Mountain to Faleys Gap.

495 South of Pikeville we collected Ridley limestone along Crystal Creek. Came home from Pikeville via Dayton, Luddy and Daisy.

Collected Chattanooga fossils on W slope Walden Ridge from upper 16" of shale.

May 9.

In morning went east of Chattanooga to Parker Gap on Brainerd Road. One mile east of Parker Gap and in fields on south side of road exposures and glades of Gaapac limestone. Among other fossils we got *Talareximus*, *Paleocis* and *Brachiopods*. Fossils are abundant.

496

Riedville \rightarrow $2\frac{1}{2}$ miles SSE of Riceville and 100 yards east of valley pike occur soft sandy weathered lumpy shales. dipping S-southeast about 30° . These shales lie on top of the Knox and about 120' above the Knox occur many fossils. These were identified as *Tensin*. Possibly they are better called *Athens*.

6E78

May 10

11

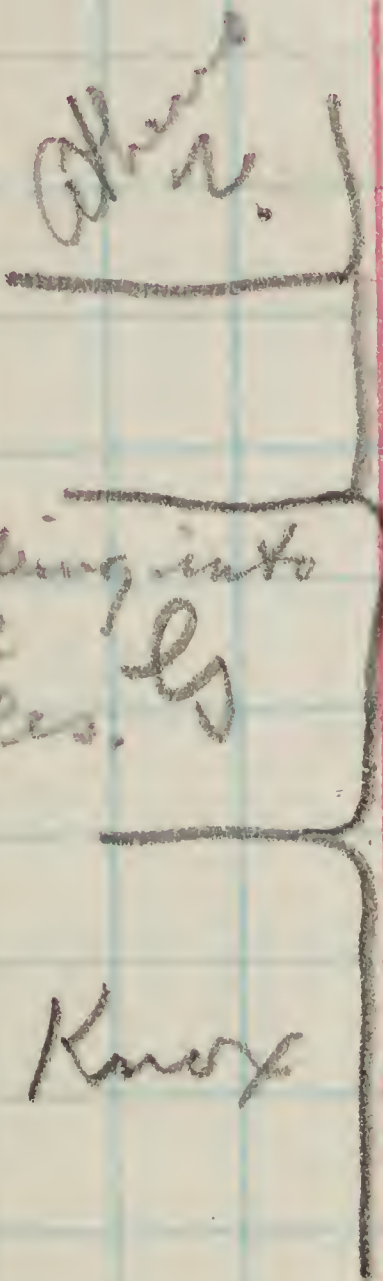
Athens Quad. 650' S40E of
RR intersection at Ay in NE
edge of Athens, bed 75' above top
of Knox. Dip 20° on Knox N45°E

497 B - *Leptophragma* & *Vakou*
about 15' below top of ls.
Many bryozoa.

498 C. Sandy yellow shale
with *Ricciella Rafinesquina*,
and *Christiania*

B - is said to be Lenoir

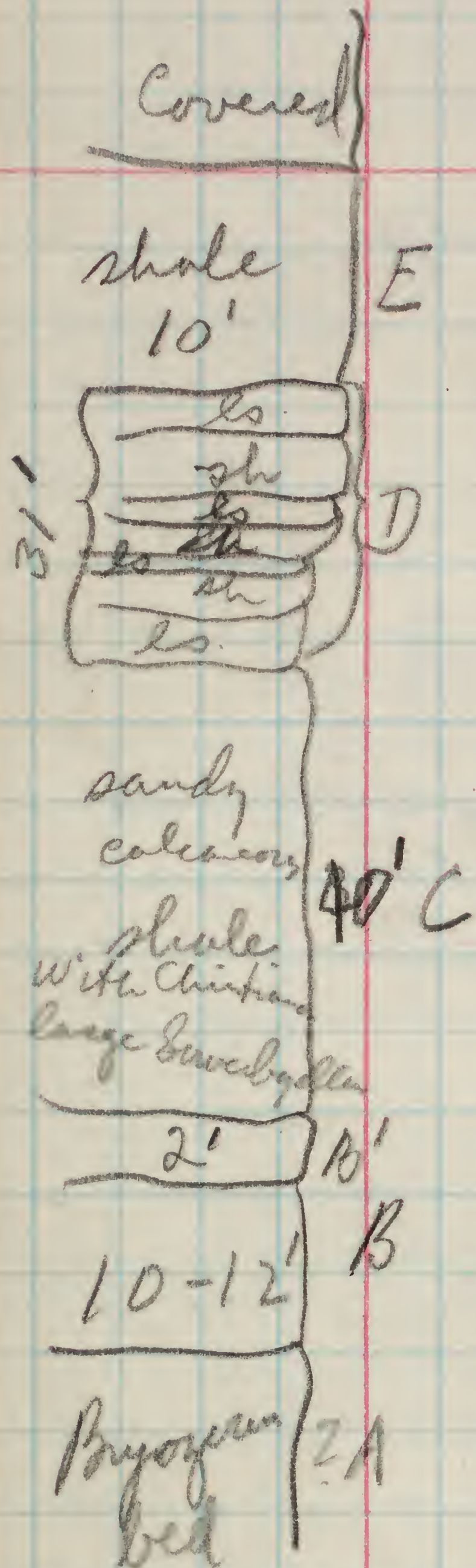
25' -



Ls breaking into
small cobbles.

497
498

1.9 mi. NE of Christiansburg



A - bed with bryozoans like those at quarry in West edge of Athens.

B. sandy shale becoming nodular + lime at top

C. sandy shale with many *Christiania* particularly in ~~base~~ a 10' bed about 10' from base

D. Sh with 3 tiers of limestone nodular friable each 1-2' thick

E. yellow sandy shale

The Athens shale appears to be passing over to limestone to the NE.

(499)

Friendsville

Mosheim appears on northwest side of the village, followed by Lenoir with Maclurea. The *Christiania* bed shows in the soil and in blocks in place at the corner of the last side street in the southeast side of town. Above the *Christiania* bed came *Multicostella saffordi* and *Plectrothis* and at very top 20' comes *Atelasma*; *Bimuria*

500

501

502

503 - 504

The Athens belt at Riceville appears to thicken and finally pass over completely into limestone between Riceville and Friendsville. A good transitional region is that 1.9 mi. NE of Christiansburg.

May 11

Went north to Maynardville from Knoxville. Stopped on Hy 33 at junction with Flint Creek road.

514

Here we collected from a nodular bed in the Othsee. Louisville overlies the Othsee at this place.

From here we went to a narrow bend of the road east of Acuff to collect from high Othsee.

Wardell

516

Here we got many small dalmanellids.

Then we collected many

517

Hesperorthis from lower Louisville at Little Baren Church. Then followed this belt westward to ~~Sharp~~ Sharps Chapel. At the end of the Sharps Chapel road a full section can be seen from Knox, Murfreesboro, Mosheim, and Louisville. Othsee is absent from this belt. We found Hesperorthis low in the Louisville of this section.

Butts got *Cryptophagnus*
above here
10/26/45

(JPA)

May 12

Went with Lee Collins into southeast side of Knoxville to see Lenoir. Here it is exposed over a large belt chiefly as knobby, blue gray weathering limestone. When exposed to weather the rock crumbles to small cobbles which contain the fossils when present.

527 Excellent exposures occur along Red Bud Road where upper 10'-20' are exposed. Here occur *Bimuria*, *Atelasma*, *Isophragma* and *Christiania*. This is essentially the same as the top of the Lenoir at Friendsville.

Near mouth of Bennett Creek Lenoir is exposed with *Bimuria*, *Atelasma*, *Laticura* and *Christiania*.

On Farm road (Tenn. 33A), 1.4 miles S of Farm bridge collected from a rotten zone in Tellico. Fossils suggested Whitesburg or Holston species: *Multicostella* and *Cyrtostella*.

May 13.

16

512

Visit locality in Fountain City on Buehler place. Behind house near creek *Oxoplectra* occurs in residual soil with *Nidulites*. The dip is generally southward. On road north of house good *O. hosei* with many fossils occurs. This dips under the *Oxoplectra* beds, making them *O. hosei* and not Lenoir as supposed by Moneymaker.

511

an afternoon drove over Thorn Hill and Evans Ferry sections

150
.9
1350

Whitesburg. The latter is quite thin at this place, not 30 over 10'.

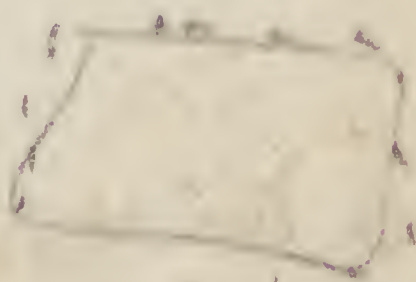
607

In afternoon went northeast on U.S. 11 for about 7 miles to collect Athens with silicified trilobites on the west side of the road. The Athens makes a wide belt here and many silicified specimens are obtainable.

Later in afternoon collected Whitesburg about $2\frac{1}{2}$ miles southeast of Harrisonburg. Relations to Athens same as other localities.

28

—



May 14

17.

Collected from beds $1\frac{1}{2}$ miles NE of Lone Mountain and 0.4 mile due north of a long arm of Norris Lake on Lone Mountain to Fajewell Road.

533

Murfreesboro limestone and Musheim exposed 0.3 mile NNE of road intersection. These are followed by yellow weathering shaly limestone with *Dolewides*, *Mimella*, *Rafinesquina*, *Strophomena*, *Sowerbyella*.

532

Some distance (70') above this zone occur *Rhynchonellids*, *Diorthis* and *Oligorhynchia*. This zone was said to be in the Lowville. The entire section above the Musheim may be Lowville.

May 14

18

Section N30° W of Eidson, Tenn

A - Knox

B - Cherty limestone forming slope with red soil and black shale chips. *Rhynchonella*, *Mimella*, *Dinorthis* 264'

C. Cobble limestone with *Dinorthis*, *Multicostella*, *Laticurra*, *Rafinesquina*, *Oxoplectra*, *Mimella* 44'

D. Alternating limestone and thin seams of shaly limestone 229'

E. First marble (Holston?) 70'

F. Shale *Mimella* *Otosee* 275'

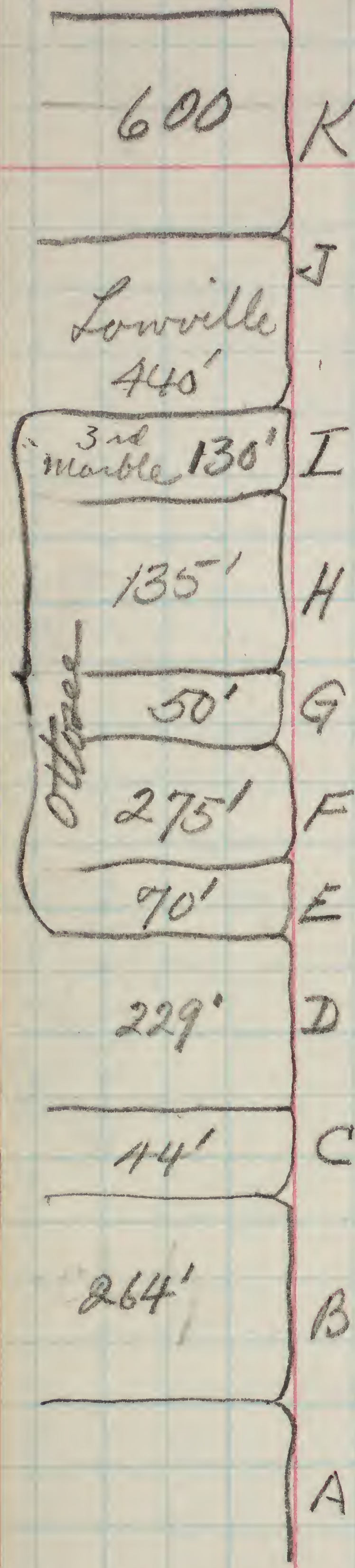
G. 2nd marble wedges out 50'
1/2 mile west of road

H - Shale with *Rafinesquina*, *Mimella*, *Multicostella*, *Strophomena*

I 3rd Marble ^{Lower half dark modular ls.} 135'
^{upper half pink marble} 130'

J. Lowville, lower red and yellow zone 220'; limy zone with *Beaticia* 220';

K - Moccasin about 600'



May 15

19

539

Shipped 4 bags from Mountsboro then went to a point about 2 miles SW of Bulls Gap to see Lenoir, Whitesburg and Athens. Lenoir is cobbly limestone breaking down to glady exposures where frost can get at it. Fossils are scarce. *Maclurites* occurs not far from the bottom. Other fossils seen were *Rhynchonella*, *Rafinesquina*, *Hesperorthis*, *Valcouria* and a flat sponge.

540

Lenoir is succeeded abruptly by Whitesburg, a thin-bedded, dark fine-grained to smooth limestone. This breaks down to slabs and pieces. The exposure is mainly of slopes strewn with the fragments. There are about 300 feet of this formation. Fossils are abundant in some of the layers.

In afternoon saw the Athens east of Bulls Gap along a stream under the RR about 1/2 mile east of the RR Station. Here it was a limestone in beds up to 6" thick. Higher in the section the Athens is blue-gray calcareous arenaceous shale that weathers to a soft punky rock. Fossils are rare.

Later went to a long
railroad cut in the Athens
one mile south of Otes. Here
the Athens is shale and thin
bedded limestone. Fossils of a few
541 kinds are common: Multicoella,
Calliops, Homotelus, Lonchodomas,
Lingula 3 sp.

0589

May 16

21

548

546

Went on U.S. 11 northeast of Rogersville to see Cambrian and Chepultpec. Between 6 & 7 miles from Rogersville the Chepultpec is well exposed. *Finkelburgia* was seen in place. *Syntrophia* was collected in loose chert.

556

In afternoon drove up valley of War Gap Creek to Speeds Ferry. The Otsego shale seemed to diminish in thickness. At Marcell quarry 12 miles west of Gate City the quarry is in the Holston? At top of quarry on N side cherty limestones contain *Dinorthis*, *Rhyndocanaria*, *Sowerbyites* and many bryozoa. Below this bed about 20' down is a shaly layer with many bryozoa. These fossil beds are about 300' above the Knox. Above the fossil beds is the Holston ls? The Holston? is overlain by Otsego with *Echino-sphaerites*. I think this Otsego may equal the yellow shale () that occurs above the third limestone and below the Moccasin at Eidson. If this be so the Otsego at Gate City is a higher bed than that at Eidson.

and the Thorn Hill section 22
 The fauna of the cherty beds
 at Marcell suggests Raymond's
 Hobson at Goodwin Ferry.

May 17.

537

Went from Bristol to Cumberland
 Gap. Went out US ⁵⁸₄₂₁ to Clinchport
 then took Tennessee 70 from
 Clinchport to Pattonville. Along
 this road is a beautiful exposure
 of Nolichucky with many trilobites.
 Saw fine section up Powell Mtn.

We went south of Ewing on
 Tennessee 62 to see the Fenster
 along 4-Mile Creek. We discovered
 Cambrian fossils in the sole of the
 thrust. The Fenster shows Clinton
 down to Maysville under the E
 and the lower Knox

May 18

561

Cut just outside Tunnel on SE side Cumberland Gap is an exposure of Brassfield consisting of greenish sandy shale, thin sandstones capped by about 4' sandy limestone. Fossils are very abundant.

562

On other side of Tunnel the Mayville is well exposed and on the H. above the Tunnel the Senoatchie or Juniata crops out and here has marine beds in it. At bottom of hill in Harrogate

563

the Trenton appears with *Platystrophia*, *Hebertella frankfortensis*, and *Rhynchotrema*.

The Louville appears below the Trenton.

568

In afternoon went of Little Lynamore Creek to collect from Louville. About 20' above a thick marble bed occurs a 10' shaly zone with *Mimella*, *Strophomena*, *Multidosella*, *Gascifera* and *Lowerbyella*.

575a

On U.S. 58, about 3 miles east of Cumberland Gap village the soil shows glades where upper Black River fossils can be collected *Hesperorthis*, *Rhynchotrema*, *Lowerbyella*, *Dalmanella*, *Strophomena*, *Pronodonta* * *Pronodonta* in Harry Whittington Coll.

The beds carrying these shells 24
underlie shales that contain ostracods
and *Pholidops*.

May 19

In morning visited Yellow
Branch about 5 miles SE of
Rose Hill, Va. Here was an
excellent display of Moshem
probably 2 or 300 feet of it.

577a

577

Collected *Tetradium cellulatum*
about 30' below Moshem and a
number of brachiopods below
that. Lenoir overlies the Moshem
and contains a few fossils.
Lowville with one or two red beds
overlies the Lenoir and is about
1000' thick.

575

In afternoon collected
lower Trenton along U.S. 58
about 3 1/4 miles east of
Cumberland Gap. Here *Dalmanella*
Dinorthis, *Lowerbyella* were
abundant.

May 20

25

Went from Cumberland Gap to Gate City and then northeast on Virginia 174. The idea was to find Fugates Hill locality of Raymond. The site of the old Post Office was found. About a mile east of this place we went across Macassin Creek and searched for fossils in the shales overlying the "Holston". Fossils were not abundant. Six miles west of Fugates Hill P.O. and on the way is another locality that afforded fair collecting.

582
582a

Mimella was common in the lowest beds but higher in the section *Strophomena* was abundant.

581

Near New Bethel Church another collecting ground was found which yielded many *Echinozaphrentis* as well as *Strophomena*, *Mimella*, *Multicostella*, *Rafinesquina*.

580

May 21

26

Porterfield quarry 5 miles east of
Saltville, Virginia

Knox is exposed near the office
on the quarry grounds but Lenoir
appears not far above it. The
lower part of the quarry is in
Lenoir and is followed by Holston.
This Holston is overlain by
Whitesburg followed again by
Holston faulted over the Whitesburg.
Above the Holston occur 3 layers
of marble, lenses in the
Whitesburg. These are followed
by other shale.

The second Holston mass seems
to me to be a typical Paleozoic
bioherm with fragmented bryozoa,
cystids and crinoids all massed
together. To me there seemed to
be no fault but the second
Holston marble was a reef in
the Whitesburg. The beds overlying
the reef lens out into the
Whitesburg.

After collecting at the quarry
we studied ~~Otosee~~ limestone
north of Marion and collected
Orthorynchula near the top
of the mountain above the
Otosee.

R. H. Hens

Whitesburg

Marble
Holston

sh + ls

Marble

Lenoir

Knox

May 22.

27

Lower beds of lower Ozone
must overlap this Lenoir.
Note 10/17/43. Off.

587

Spent all morning packing 8 kegs. In afternoon visited quarries in NE edge of Marion. Here 50' of Mosheim lies on the knob and is overlain by 50' of Lenoir, nodular limestone which is shaly in the upper 5-10'. This shaly part contains brachiopods suggestive of the upper Lenoir at Knoxville such as *Bimuria*, and *cl. sphenocrinus*.

589

Then we went 5 miles west of Marion to see Onondaga chert overlizing the Ordovician.

May 23

590

Went from Marion northeastward to vicinity of Bland where we visited a small quarry in "Holston ls". This was a very pure crystalline limestone but fossils were not abundant. This quarry is said by Mr. Butts to be the McIntosh by mentioned in Raymond and Willard's paper.

After lunch in Bland we went down main road to SE and took first left turn to the Grayson farm. Here we

598-

598a

598

saw Holston again like that at the McNutt Quarry. Above 28 it came thin-bedded gray granular limestone abounding in Trilobites. This is the Whitburg limestone. Above the Whitburg occurs smooth black limestones that weather to ash gray. These belong to the Athens formation. Above them occur dark gray Osoe limestone.

598-a

May 24

599

In morning went from Salem, Va over Catawba Mt to Catawba Valley. went west of Catawba Sanatorium about 11 mile. Here we collected from Lenoir. Cyrtotrochella & Paratrypa c. as small Rafinesquina-like that at Riceville, c. These beds were originally called Holston by Edh. If not Lenoir they may be Whitburg because Mr. Butts puts upper part of these in the Whitburg. Lithologically the lower and upper parts are alike. The Lenoir + Whitburg together are not over 25'.

In afternoon met Bevan in Roanoke. Then went on to Lexington and visited Winkle

601

Creek about $1\frac{1}{4}$ miles NW of the City. Here a thin layer of Mosheim rests on the Knox and a thin Lenoir lies on the Mosheim. Fine specimens of *Hesperothrix*, *Minella*, *Multicostella*, and *Valcoura* weather out of the Lenoir. The Holston is enormously thick here, the Whitesburg is thin and the Athens enormously thick.

May 25

602

Visited Whitesburg about $\frac{3}{4}$ mile WNW of Lexington. Whitesburg consists of nodular limestone breaking down into slabs & plates. *Trilobites* common, *Oxoplocia* and *Parastrophia* fairly abundant. Suggests Ulrich's Strasburg formation.

603

In afternoon came to Harrisburg by bus in order to permit Whittington to visit Spring Hill.

May 26.

605

Went to collect "Whitesburg" one mile south of Paulington. Here silicified fossils occur in granular lenses in the Athens. In silicified specimens should be called Athens rather than

October 18-24, 1943

October 15.
Reservation and passage to
Charlottesville

✓ 4.83

October 18.

Lunch

✓ 0.50

Supper

✓ 0.70

Salem for lunch. Then went on to Jazewell where we refueled our memories on two sections. Collected good *Tetradium* from Sutton at North Jazewell and *Ancistrobryozoa* from the Murfreesboro. Had supper in Jazewell and then went on to Lebanon for the night.

October 19.

Saw section $\frac{1}{2}$ to $\frac{3}{4}$ mile ENE of Belfast Mill and on southside road. Section shows Wardell with *Columnaria* about 150 yards S of road and east of large brick house. Just below beds with *Columnaria* we found a large *Schizambon*, abundant. Section below Wardell not intelligible to me. Below Wardell are reefy beds 150'. Below these are 35-40' coarse ls. *Spirifer* top of Benbolt. Then below here 30' buff weathering nodular beds of Benbolt (Zone 13). Below these are 20' granular ls. with *Dryopora*, probably Benbolt. Then sparsely chert of ls. of *Hedleyella* beds 150'. Coarse granular, light grey ls 60' Ward Cove. Then top of *Leptobryozoa* beds. Wardell about 250'.

H31A - Small washes in Lower O. House = Benbolt. Contained numerous brachiopods and a few crinoids. Collecting excellent. Beds occur just above *Echinospira* and are same zone as at H7A. This may be Upper Chambersburg.

H1A - Lohjambon from Wandell 0.6 miles
ENE of Belfast Mills about 150 yds S of
road + east of brick house.

H2A - About 40' of Blackford with *Dunorthia*,
Holden, *Calliope* and a *Strophomena* at top.
This locality on N side road opposite first
house, ~~on~~ 3 mile east of Belfast Mills.
H1A + H2A on Saltville T.

H3A - Elk Garden □, SW 1/2 S center sub-
quad on loop 1/2 mile S of Rockwell on
St. Hy. 80. Shaly Benbolt - lower O'Hara
with big *Mimella*, *Oxyplocia* etc.

H52A-1 - In bed of Moccasin Creek just N of
bridge and about 25' above basal conglomerate
of Middle Ordovician came red granular limestone
with small *Rosticella* suggesting *Mooheim* and
type Lenoir. Along road east of bridge is a
long sequence. First were seen *Mimella*, then
came a zone of *Dunorthia* *Holden* with *Camerella*
and large *Ophina*. Whole is suggestive of
Strobsburg rather than Blackford - *Murfreeboro*.
This was followed by a bed with *Sowerbyites*,
large *Dactylogonia*, *Dim. atavoides*. Above this
a bed packed with *Dim. atavoides*.

Moll Creek □ at crossing of Co. Hy 67 ¹⁹ over
Moccasin Creek, 1.6 miles east of junction
with St Hy 74 = Co. Hy 613, and about 3/4 mile SSW of
Junction.

Breakfast

✓ 0.50

Lunch

✓ 0.42

Supper

✓ 1.00

October 20.

Breakfast

✓ 0.50

Lodging (2 nights, Oct. 18, 19)

✓ 5.00

Supper

✓ 1.40

Lunch

0.30

~~Noted in log already~~
~~not 676~~

These little *Strophomena* were also seen by Cooper & Edmundson
on Mendota sheet 1/3 mile SW of Russell-Scott line paralleling NW-SE segment of Moccasin on St Hy 74.

October 20. South slope of hill on which Hagan School stands, Hilton sheet.

Din. Transversa zone contains *Stroph. Tennesseeensis* and a *Campylotthis*. A peculiar *Resserella* was rare.

In *Echinoplacites* zone *Paleostrophomena* occurs. Cooper reports presence also of *Oligorhynchia* at this horizon. This locality called H 26 A.

H 7 A - Hilton □, 2 collections. 1. from slope of remnant on west side hill east of secondary road 1/2 mile due west of Cedar Point school. This was *Echinoplacites* zone with *Paleostrophomena* and other peculiar fossils. This is base of Cooper's Benbolt.

Higher (south) along old road at fork comes upper O'Hosee with large coarse-ribbed *Campylotthis*, *Spinaria* and *Hesperotthis*. At base is a cherty bed which separates Benbolt from Wardell. Upper O'Hosee is Wardell. At top come numerous corals, then the Bower sandy beds and the Moccasin.

H 30 - on old road about 0.1 mi S of house 1/2 mile SW of New Bethel Church is a reef in upper Wardell, a reef of *Stromatoceras* and *Dystactospongia*. On E flank of reef occurs a layer abounding in *Columnaria*.

Took up *Coelospira nitens* author for Coq.
" " *Orthorhynchula stewarti*

1.40

.38

.50

2.00

3.80

1.40

5.00

1.50

.92

4.83

1.20

22.93

12.00

34.93

2.00

3.00

2.00

3.00

12.00

October 21. Went over to Edison in morning.
zone of abundant *D. atavoides* is about
5' vertical above the zone of abundant
Sowerbyites. The latter genus also occurs
in the zone of *D. atavoides*.

About 100' below the *Dinorthis* zone in
field to east of highway fossils are fairly
common & include a multiplicate *Canella*
like *C. elliptica*, *Hesperorthis*, *Mimella* and
Murina. This horizon may be close to the
Murina zone of Yellow Branch.
Several *Marbles* occur in the Otisco
here. They are reefs without a doubt.

Hotel at Knigsport	✓ 3.00
Breakfast	✓ 0.80
Lunch	
Supper (Morristown)	✓ 1.20

In the Thorn Hill section *Fascifera*
underlies *Pionodema* (as it appears in
Cryptophagmus). This is indicated by position
above saw *Fascifera* but not *Pionodema*.
Zygospira indicates Witten.

Oct. 22.	
Hotel (Morristown)	✓ 2.00
Breakfast	✓ 0.50
Lunch	✓ 0.38

at bend $\frac{1}{4}$ mile - $\frac{1}{2}$ mi. East of Red Hill
big development *Sowerbyites* beds, with
S. willardi. H13

$\frac{1}{4}$ mi. E. Beech Grove Ch. occurs *Oligophymia*
beds which are above the *Sowerbyites*. H12A

The *Sowerbyites* bed is above *S.*
inscriptus bed & this zone may tie close
to *Calymene* zone farther north.

Supper Bristol	1.40
----------------	------

Herbell = Wardell

Moccasin

Witten

Bowen

Wardell

shaly

marble

sh. with
Reeps

marble

Lo House (Gentolt) Sh with Dirollandi

Clifffield

Mrs.

In Horn Hill section the lowest shale is called O'Horse. This is low O'Horse, possibly correlative with low beds of O'Horse seen farther east. This zone, I think is definitely above the Sowerbyella-Din atavoides zone which was not seen in this section.

Chesney - not far east of Luttrell on Luttrell (TWA) Quad. On road just east of school and running across school grounds on south side is crumbly modular limestone with Sowerbyites and also Oligorhynchina. This zone thus ties well with the Oligorhynchina zone just west of Horn Hill and the Sowerbyites zone of Red Hill. At latter place *Devianthis willardi* is abundant with the Sowerbyites.

October 23.

Hotel at Abingdon	2.33
Breakfast "	0.70
Lunch	0.15
Supper	1.25
	2.10

H15A - Burke's Garden 17, 1 mile SSE of Sharon Springs on St. Hy 42. and 1 mile due east of Red Oak School. High in Athens (125' below top). Contains *Echinospira*, *M. bursa*, *Orthis*, *Leptellina*. This I think is same bed called O'Horse by Butts but high Athens by me at Shayson Farm.

Travelled from Abingdon to Christiansburg via Ceres to see Devonian and Whitesburg. Christiansburg for the night.

12/2

10/21

7/2

9.5.175
8
95.5

37.158
56.95

10/2

312.09
60.215
100.00

9/21

20.04
18.82
46.86

21

28.82

10/2

21.53

6/13

Don't talk

Oct 18

Oct 19

Oct 20

Oct 21

Oct 22

Oct 23

Oct 24

~~0.40~~
4.85

~~0.50~~
4.70

~~4.50~~
4.42

~~4.40~~
4.30

~~3.00~~
2.80

~~2.50~~
2.38

~~2.33~~
0.70

~~0.85~~
1.40

37.78

Days before 40

Diff. days free, and
home or paid 38.78

Abington

Weymouth

Weymouth

Weymouth

Weymouth

Weymouth

Weymouth

Weymouth

Weymouth

Weymouth

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Weymouth

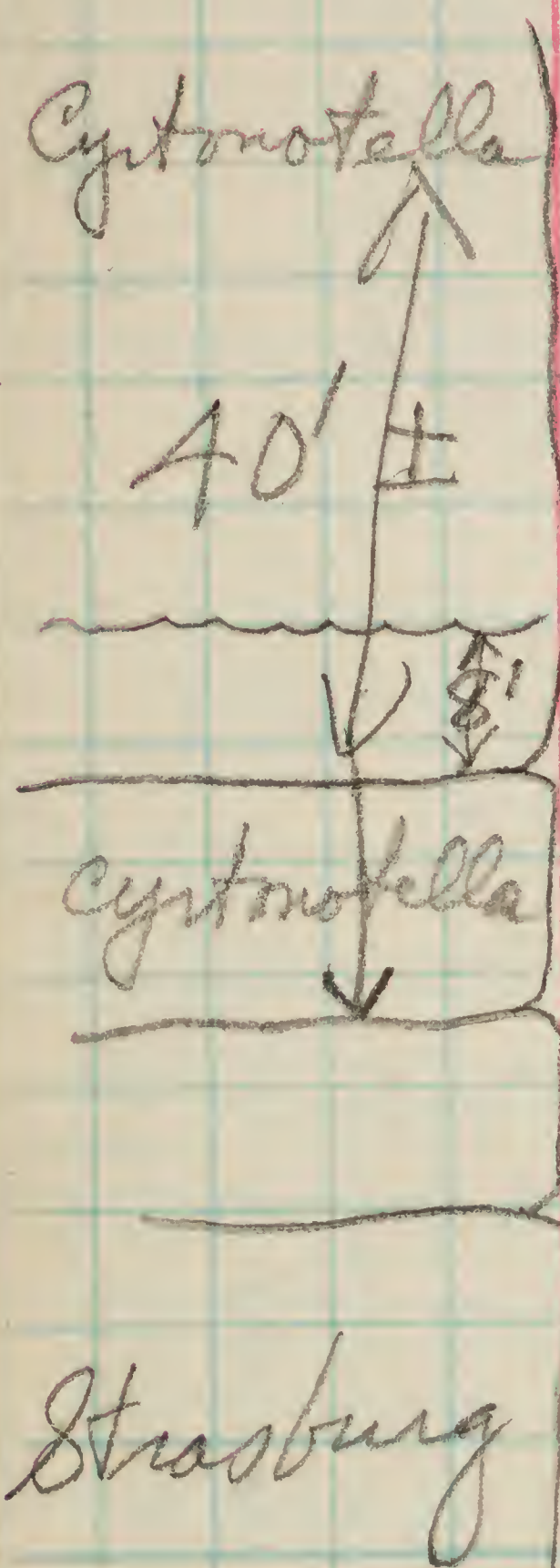
Weymouth

July 11.

also section at St. Luke
Christiania occurred ^{with micrites} in the
interval usually assigned
to the Greenesth. and in
corresponding beds to those at
Lamell Mills. That contained
the *Cryptophragmus*.

0608

July 14
 Breakfast .65, Lunch .40, Supper 2.00 Room
 Strasburg Junction



A - Just above Lenoir are 10' of blue gray weathering, but black ls when fresh and suggesting Athens lithology

C² } B - Approximately 9' granular coarse ls. with *Cytonotella* and abundant *Trilobites*. Probably lower part of my silicified horizon.

C' - The next rock for over 100' is nodular, cobbly with shaly partings. In lower 40' or perhaps 60' *Cytonotella* is common with many other types suggesting Whitesburg.

C² - Same as below. In all these beds *Chlamids* & *clotoloids* are abundant. At 8' from bottom of C *clotolus* is abundant, in fact these beds may be Butts' *clotolus* bed.

B. suggests the Whitesburg interval seen 2 mi S. of Harrisonburg
 The Strasburg Junction

section is like that at Paulington where a thin Whitesburg overlies Lenoir and the Athens slope above or east of the Whitesburg produced *Ptychoglyptus* and *Phragmothiris* like the Strasburg Junction section. On July 12 we found several *Resserella* in the Whitesburg here. Also *Resserella* occurs in the granular beds of B.

We saw *Dimorphis* like *D. transversa* in Chambersburg in + for some distance above the Whitesburg interval

Section on US 40 W of Hagerstown

Nodular beds with *Ectinospira* and for some 100 feet up, I think correlates with the Cornwell thin beds at Marion

In this section at base occurs rock called Kay's Tiger-stripe which suggests Butt's Lenoir. This is subdivided in with Lewisville-type rock. Perhaps Lenoir gives way to Washburn type rock. This is followed by cobbly shaly rock, Shippensburg of Kay and this by *Nidulites*-bearing Chambersburg type rock.

July 13.

Lunch 10.45, Supper 1.50

Room & nights Chambersburg

& 2 breakfast 3.00

Visited Fort Loudon but section too poor to spend much time on it.

Section at St. Thomas good. Found Nidulites under Cryptophagmus. Stose reports Nidulites as abundant above Cryptophagmus but we were unable to affirm the point.

After visited Marion cut and worked in Stones River group until rained out. In measuring this section we started the mid-Ord. where the Dolomite ceased. But Stose & Bassler have 600' of alternating dolomite & limestone beneath Nidulites. The latter was common in places. Brachiopods were abundant near the middle. The middle cherty zone was very distinctive.

00
00

July 14 0612
Lunch 0.50, Supper 0.95

In Marion cut Mercersburg
limestone begins at top of
cystid which is placed in
the Shippensburg. The Greencastle
occurs on the west side of the
road-RR crossing. In this
sequence the Makinides beds
probably equal Ulrich's Stradburg
and the up. Stones River
could be Walcott, it had
Tetradium in it and is over-
lain by rocks with *T. cellulosa*.
These were called Lowville but
actually occur below the
horizon of *Cryptophragma*.

July 15

Breakfast 0.65, Lunch 0.40, Supper 1.14
 Room & nights 2.00 $\frac{1}{4}$ mile
 $1\frac{1}{2}$ mi. SW of Wadesville, S of
 St. hy 274

M
 Nidulites
 in dark ls
 100'
 cobbly, weathering

Siltstone 35'
 20' Chamber-
 burg ls with
 Nidulites

Homokles is 100' below top
 of Athens. Lenticularities of
 Chamberburg type of rock
 occur in Athens

Cryptophagnus was
 grapholites found about 10' \pm
 below a silty bed with
 Renssella.

Siltstone at top consists of

Siltstone	3'	
ls	16'	
Siltstone	8 1/2'	
Bentonia	7'	silica 3/4"

450' ls
 Athens type
 150' above
 base of zone
 of Echinoplurites

60' Lenois Renssella near top.

Moaham
 70'

$\frac{1}{2}$ mi SE of Rest, 0.4 mi
S of W. Va line in Virginia
 $\frac{1}{2}$ east of US 11 on Co. rd. 669

Chambersburg 400'
Nidulites within 75' of top
and down to 75' above base.
Christiania at top.
Nids + Lambrophyllum are
middle 200'.

Echinospiriferites 25-50' above base
Few intercalations of Athenstypa in lower 200'
Lenoir 100' (Athenstypa seldom more than
Mosheim 140' fine grained ls.
Blue ls cobbly under Mosheim

1 mi N of intersection of 607 &
St Hy 12, In big bend of Shenandoah
R., Warren Co., Va.

Sh with ls intercal. (black)	118.
Lg + Sh	20
Black ls. + thin sh.	56
Shale thin ls. intercalation	14
Lenoir (granular, fine, cherty)	59'
Mosheim	51

East side U.S. 11, at Van Cluse
just N of old stone Qy, S. of
Stephens City.

Martinsburg - sandy ls. with
Christiania

25'

Chamberburg

5-75'

Nodular ls with
ridges down to 75' of base and
within 5 or 10' of Christiania bed.

Lamtophyllum abundant in mid of this
Siltstone

2' 2"

Lenoir

100'

Mosheim

135'

Trumbling Run

Brachiopod beds are first
nodular, shaly beds above
siltstone and contain

Oxoplesia, Christiania

Sphenozella Echinophaedusa (low)

Smotheria, Cornucopia

Was unable to identify coarse
granular beds at base of
nodular zone

July 16

Breakfast 0.65, Lunch 0.45 Supper 1.25
 Room Woodstock 1.00

St. Croix Junction
 Dimorphia a theodora, ^{moderata} and
 Sowerbyites occur in RR cut
 near point of V between
 diverging tracks just W of
 switch. They Dimorphia occur
 with Girvanella in places.

In the ravine fully 100'
 should be assigned to the
 interval above the very
 granular bed. The brachiopods
 peter out about feet
 then comes nodular limestone
 with less shaly partings but
 abounding in Trilobites &
 Trilobite fragments. Dimorphia
 occurs for 25' above the point
 where brachiopods cease to
 be abundant. A large
 Composita occurred in the
 top half of the brachiopod
 (Cytonotella) beds.

Thomas Brook — 1/2 mile
N. of Thomas Brook

This section is a duplication
of The Lumblyng Run section.
In the nodular beds on the
siltstone occur *Cyrtospira* and
higher in section are *Dumortiera*
+ *Cornuthis* just below *Nichulites*.

July 17
 Fayette Mill Section
 Breakfast 0.65, Lunch 0.50,
 Supper 1.65, Lodging 8.00

A - Lenoir, black ls weathering
 into thick slabs with irregular
 surface. Chert not numerous
 Weathers blue gray. Small
 lower *Orthis* numerous,
Mimella, *Multicostella*,
Cerasurus, *Nidulites* near top.

B - Cobble limestone with
 shaly partings, *Homotelmus*
 abundant at base but
 common throughout,
Resserella, *Opikina* abundant
 at top, *Resserella* thruout.
Conicostoma found here
 on first visit, July 11.

Echinospira near base
 C - *Nidulites* beds, cobble
 limestone abounding in
Christiania at base, *Mids*
 throughout, *Lambeophyllum*
 in upper half, *Strophomena*
 near top with *Cryptophyllum*.
 The Crypto bed had not an
 adjacent block with it.

D. Coarse granular ls with *Pionodonta*
 at base and *Columnaria* at
 top. Is contains much
 chert above lower
 granular part. *Cryptophyllum*
 in this zone on Stickle place

Granular
 ls. +
 Vaughanite

Cryptoph.

Christiania

Opikina -
 Homotelmus

Lenoir

Mosheim

C

B

A

Strickler place
 In Vanhantick's six
 specimens of *Cryptophagum*
 were found. 250' west of
 house to 40' N of road. The
 zone about 18' thick, occurs
 about 30' below the base
 of the Martinsburg, here dark
 shaly cobble ls. with *Oxoplectia*
Eoplectodonta.

500' west of Lee Jackson Hotel,
 New Market, Va. Doubtful
Cryptophagum near top of
 Chamberburg in block with
Nidulites.

July 18

Room 1.50, Breakfast 0.85

Div A of
Chambersburg
Div B contains
Sowerbyites

According to R.W. Cooper
granular rocks in Tanom
at Goodwin Ferry was
called Halston by Raymond
Sowerby it was found on
top of granular beds in
Cherty ls. see section Baabers
Cement Resources of Va p. 198

at Stanton on Edge
of City on abandoned
Trenton line of Ches. & Western
RR Tanom contains great
reef of granular ls called
Marat by RSB. Cherty ls
occurs above & below the
granular beds.

Cooper says that lithology
of upper Chambersburg at
Lantz Mills suggests Stanton
but the coral Columnaria is
only known from Wardell
and probably the coral is a
better means of correlation
than the lithology. Thus top
of Chambersburg here may
be Wardell.

0621

1 mi N of Bassett
W Va

Edinburgh

N.M. 140' Laminated

Whistle
Creek 30' Machinists
Unlaminated ls

Knox

UNITED STATES NATIONAL MUSEUM

Field Label

No. -----

FORMATION:

LOCALITY:

Collector:

Date:

Memoranda:

Note Book:

Page:

Falling Waters Sect

Ed

NM 160'

W. Ark 60'

Calcareous

Knox

UNITED STATES NATIONAL MUSEUM

Field Label

No. -----

FORMATION:

LOCALITY:

Collector:

Date:

Memoranda:

Note Book:

Page:

Dip 45°

Map of Jefferson
Berkeley & Morgan
Cos W Va

D. P. Dransday 1916

graptolite
sh.

Nealmont 2
70 paces

70 paces

Nidulites

183 paces

granular

23 paces

{ 11 paces from top NM
to siltstone 1'?

N

M

102
paces

10 paces

Dolomite + ls.

65

Duncan River
just N. of
W Va line.
1 mi SE of Ridgeway

UNITED STATES NATIONAL MUSEUM

Field Label

No. -----

FORMATION:

LOCALITY:

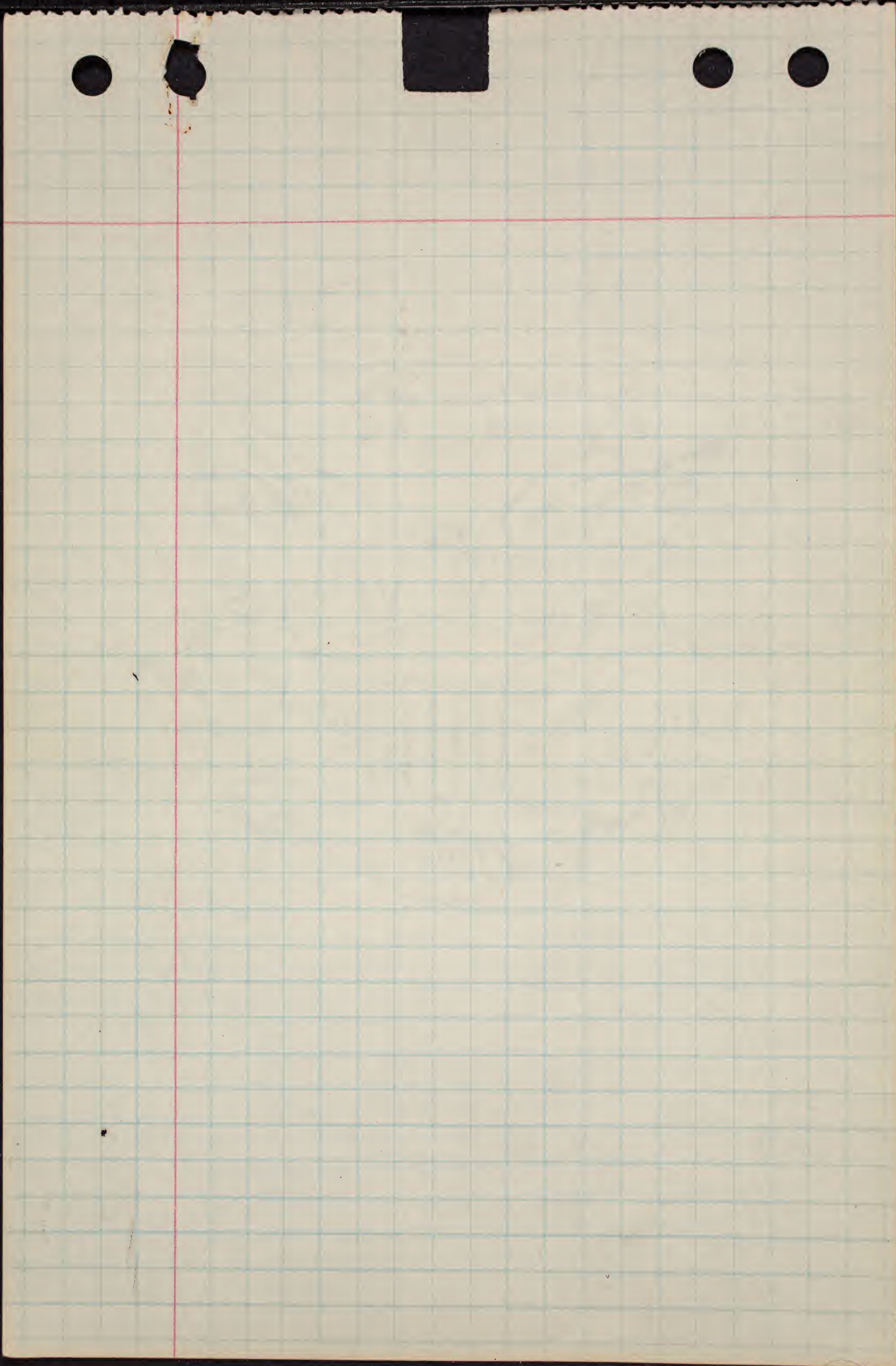
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0622

1944

October 20

RR fare Washington to Charlottesville 7.94
and returnPullman (Includes tax .94, pullman .65, tax .10)
on fare on out 1.10Supper 0.30
Lunch to RR

October 21

Lunch 0.40

Supper 1.00

First ~~stop~~ section visited was on US 11 about 1/2 mi SSW of Jambling Run at big bend in road. Tidalites beds occur in front of house. Between them and Oranda occurs ls. with numerous small *Strophomena* and *Lambeophyllum*. The Oranda is 25-30' thick and is graminates in a bed with numerous bivalves. It is followed by a coniform jointed layer BNC says looks like Eggleston.

Second stop is 0.4 mi W of Junction US 11 and Va 55 just north of Strasburg. Oranda well exposed, nearly vertical. Tidalites beds in field near side road are followed by sparsely fossiliferous massive and weathering blue grey mottled *Camerozaphia* ls. strongly suggesting the Mercedefung ls. Oranda is very similar to that seen at first stop.

3rd stop at Hays Hill to collect shale with *Renssella* on roadside. This is well down in the Tidalites bed near its middle, probably in upper 100'.

5.80

October 22

V.

Lodging

Breakfast

Lunch

Supper

Lodging Winchester

Breakfast

Lunch

0.85

1.00

0.50

0.45

1.10

1.00

0.50

0.40

Oct 23

Morning spent at Marion cut.

Search for Dinorthis atavoides in beds just under Shippensburg in vain. Concluded all beds down to Lowville are Shippensburg. Searched cherty beds for Strasburg fossils. Found no unequivocal ones. Did find Cam. longirostris type suggesting Chazy. Mosheim at base contained I. syringopteroideus. We think it possible that the Maclure beds are local to this section. Possibly they are lower Strasburg and that Lowville beds between the Shippensburg and Maclure beds are a facies of upper Strasburg.

In afternoon went to cut just west of Hagerstown, 7 miles. Here the beds just under Shippensburg contain I. cellulorum, small Strophomena and Lepidoditias just like the same beds at Marion. Below this Lowville are about 400' of limestone with Ronail-bearing Mosheim at base and peculiar buff gray smooth fracturing ls. in middle. No rock related to Strasburg was seen in this section.

Went to Pineburg to see section along RR. Went into large quarry on S side of RR and here found enormous sequence of Mosheim forming edge of quarry along river.

3

side. ~~But~~ We estimated about 300' of limestone below Shippensburg. Near middle a few beds with mottled appearance suggested Strasburg ls. but no fossils were seen to prove the point. Here are two sections showing tremendous developments of calcilytes with only minor or no developments of Strasburg. The Strasburg may finger laterally into these big masses.

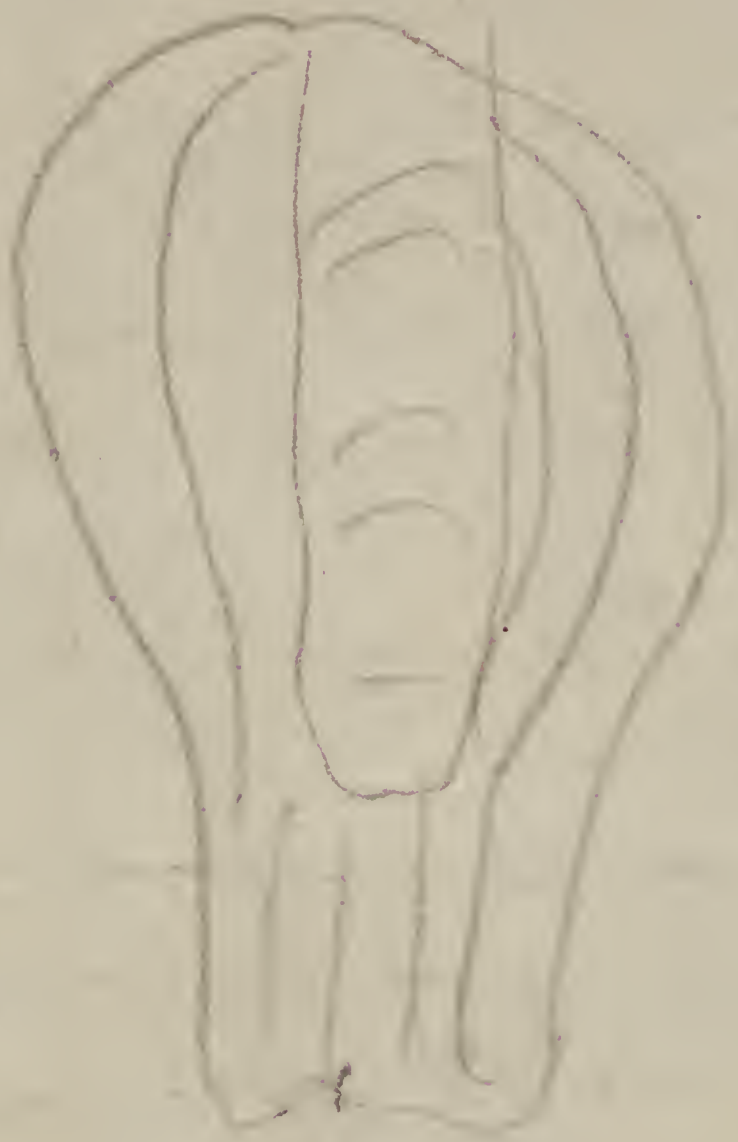
Oct. 23.

Supper (Harrisburg)

0.85

First visit Riverton, near Front Royal. Mosheim about 30-50' and Lenoir of about 15-30' but big thickness of ~~the~~ Athens. At top occur coarse ss and sandy sh. with *Diplograptus* but also *Cryptolithus* which may represent thinned representative of *Renssella* bed. This puts a good ceiling on the Athens.

About 1/2 mile S of Woodstock on US 11, take first road east, right next to a large cannon (Griffill Flint). Go east first house. Then go north thru pasture gate. Oranda formation with limestone below, 700' of which contain *Cryptophragmus* at 3 or 4 levels. The lowest bed shows *Cryptophragmus* with *Midulites*. Oranda very fossiliferous.



150-
175- *athens*

4

Last stop of day was at big bend of Shenandoah river where it joins close to US 11. Here about 1 mile north of the bridge at Edinburg is a dam. Big section including about 600' of Mosheim, 125' of Lenoir has been cobbly, much chert, and many fossils. Above come 100' of cobbly black anorthite, ash weathering so with *Christiana* and many *Conionthis*. Above this occur slabby Athens ls. beds, slabby with *Nidulites*. These mid beds are more like Athens than the mid beds to the north. ~~Above~~ The *Nidulites* beds are about 175' thick.

Next follow 100' of heavy bedded ls. with *Cryptophagnum* common from base of top 50' to within 15' of top. *Cryptophagnum* in granular and anorthite ls. brachs in granular ls. Top of section is Oranula sandy beds 30' thick with *Christiana*, *Leptellina*, *Oxyplecia*, *Rensschella* and others.

The Lenoir in this section contains silicified bryozoa and *Tribolites* and is worthy of exploitation.

Oct. 22 - At Martinsburg on E side City *Nidulites* beds of Chambers rest directly on the vanhookite beds of the Lowville (Stones River) limestone or Anany rock.

$$\begin{array}{r}
 4.50 \\
 21 \\
 \hline
 450 \\
 900 \\
 \hline
 21 \overline{) 94.50} \quad (4.5 \\
 \underline{84} \\
 105 \\
 \underline{105} \\
 0
 \end{array}$$

$$\begin{array}{r}
 175 \\
 250 \\
 \hline
 425
 \end{array}$$

Oct. 24.

5. Look up Butts coll from
Siltstone in Wadesville coll.
See also colls. from below siltstone
especially the Driside.

Lunch	0.45
Supper (Marion, Va)	1.30
Lodging (Abingdon, Va.)	2.50

Went from Charlottesville to
Abingdon, Va.

October 25

Breakfast	0.60
Lunch	0.60
Supper	1.25
Toll Bridge	0.35

Upper Limer at Knoxville may be
Ottosee-like facies of Whitesburg.

Just W of Strawberry Plains oolite
sections of Holston, Sevier, etc.

Left Abingdon about 8:00 AM and
headed for Mosheim. Visited cut
about 1 - 1 1/2 miles west of Mosheim
on Southern RR. Here are about
60' of Mosheim resting directly on
Knott dolomite. We saw no fossils
or channels under the Mosheim. Cooper
and Edmundson think this Mosheim
has all the characters of the Virginia
Mosheim. However we did not
see any Tetradium in this forma-
tion. Mosheim is fairly common
in the Mosheim which may be

6 a facies of the Mosheim beds of the Lenoir. Above the Mosheim occur 45' of dark to light granular, shaly limestone suggesting Lenoir but we found no fossils that proved it. The granulosity of the beds suggested Whitesburg to Logan and Edmondson. I found what appeared to be a Glypturus.

Above the Lenoir or Whitesburg came graptolite shales with thin limestone lenses containing graptolites and also linguloids. Over the first low hill comes dolomite showing a fault to be present. We are not yet sure of the Lenoir age of the limestones above the Mosheim.

Lenoir City.

Here shaly limestones with cobbly small knolls and sandy shale rest directly on dolomite. The lower dolomite of about 5' thick looks like Mosheim but is thinner bedded occurring in layers about 8-10" thick. We agreed it was not Mosheim and that the Lenoir rests directly on dolomite. The basal Lenoir contains a small rhynchonellid in great abundance. Above this some 25' appeared Mosheim in abundance. The limestone contained many bryozoa and in some respects suggested the 45' at Mosheim but we saw no Mosheim above the Mosheim at that place. It is possible even the lowest Lenoir = Valerian rather than Given Pt. down the small stream Lenoir was seen showing several hundred feet of this formation to be present.

Oct. 26.

7

Breakfast

0.50

Lunch

0.28

Supper

0.60

Visited sections on RR cut about 2 mi. NE of Athens courthouse. Exposures not good and mostly of leached sandy shell of a bright yellow to yellow-brown color. Exposures at RR-highway crossing at 948 consisted of shaly-calcareous shales with calcareous nodules. ~~Lenticular~~ is abundant. The rocks here suggested Whitestown to me but the ls is not granular.

Second section seen is 2-3 miles SE of Charleston Tenn in Henniger Bluffs along Hiwassee River where river and highway come close together.

Lenoir - exposed at west end of exposures and consists of nodular limestone with calcareous shaly to sandy partings. We did not see the exact contact with the Knox and we saw no rhynchonellids at the base. The lower 30'-40' of nodular limestone contained small *Glyptothorax*, *Valcouria* and *Orthommaton* together with numerous bryozoa. The uppermost 20' of Lenoir are quite different from the lower nodular beds in being irregularly bedded somewhat calcareous silty rock with many *Christiana*.

Athens - overlies Lenoir and consists in lower part calcareous shales weathering to ash gray and having a dark gray color. We saw no black shale in the sequence. Lenticular layers and nodules occur but they are very poorly fossiliferous. They are

8 dark brown gray in color and with distinct grain. The very shaly part represents perhaps $\frac{1}{3}$ of the total thickness below the Tellico. Above the thin-bedded shale the rock becomes sandier and heavy-bedded and near the top is a very fine-grained sandstone with fossils. In about the middle of the upper $\frac{2}{3}$ occurred nodules with *Lonchodomas* abundant and like the rock seen in the railroad cut. At the top of the Athens are nodular shaly and granular beds suggesting O'Hara.

Tellico - Thick bed of calcarenites and red ss. with much ferruginous material.

Lenoir - Thin-bedded sandstone and calcareous sands looking very much like Martinsburg.

T-8 - About 5 miles SE of Sweetwater on Tenn 68 and $\frac{1}{2}$ mile SE of Gaines school is a glade slope in upper Athens. *Lonchodomas* is common but also a few brachiopods suggesting the upper Lenoir at Friendsville.

Section one mile SW of Gaines school on Sweetwater ☐ shows nodular ls beds interbedded with yellow sandy shales that breaks into very small lumps. Here large *Sowerbyites* and *Christania* are abundant.

No *Maclurites* were seen in any of the Lenoir sequences seen on this day.

October 27

9

Breakfast

0.45

Lunch

0.40

Supper

1.15

Lodging (2 nights Athens)

5.00

" (2 nights (Oct 27-28, Alhambra)

2.00

Friends

Spent entire day at Friendsville. Came in on NW side of village and worked near white church just in front of cemetery on NW corner of town. On road opposite church and in woods just N of Church Knox dolomite occurs. Above a short covered interval comes a bed of red and green mottled limestone which Cooper thinks belongs to the red beds at the base of the Blackford. This is followed by another short covered interval, then comes Mosheim. Traced NE these two beds appear in contact at the very NE corner of Friendsville where 4 houses occur in a row and just NW of a school. At this part of town Furmanella beds + Mosheim were seen not far above the Mosheim.

Following the Mosheim SW from the church in NW corner of town that limestone occurs on a slope just south of the church and is overlain by crystalline limestone. A large piece of red limestone (Blackford) occurred below the Mosheim. Below the Mosheim and occupying the slope from the edge of the cemetery to the stream occur reef limestone with Stromatocium-like structures, numerous massive bryozoa and lime sand. In spots this has broken down and fossils are abundant: Plectopora, Dactylogonia were common. The whole layout suggests the Valeau reef at Copperville, Ky. This material seems definitely to be below the Blackford.

10 and above Knox. It may be a swollen reef on the flanks of which *Western* occurs.

Along the creek from the mill upstream shaly limestone with *Oristromia* occurs. The *Oristromia* is abundant in the soil on both sides of the creek. The Lenoir becomes more cobbly upward to the top where it is very cobbly. In the top occur many fossils. *Plectotthis* and *Multicostella plana* occur about 75' below top. Large *Opiterna* occurs at the top.

Above the Lenoir is Holston marble, shaly near top with *Multicostella* (check with mine from 8 mi. WNW of London). Above Holston is Jellies and above Jellies is yellow sandy shale containing some marble beds and a specimen of *Campylotthis*. According to BNC this is upper Ottersee. The *Campylotthis* was a biconvex type like some lower in the Ottersee. Cooper (B.N.) suggests that the cobbly upper Lenoir may be equal to Farber Ottersee (possibly his Ward Cove, possibly the lowest *Echinospira* beds).

The top Lenoir suggests the high Athens seen on the road SE of Sweetwater on Oct. 26. It looks as though the Lenoir completely replaces the Athens and the part replaced would be about the middle.

October 28

Breakfast
Lunch
Supper

0.60

0.60

1.40

Section $\frac{3}{4}$ mile NE of Friendsville
along spur into quarry and hill
slopes to north

Cobbly ls. to top of Lenoir

Cobbly ls. with *Dactylogonia*, *Plectothis*, *Sowerbella*
Lonchodonta, *Encrinurus* 25'

Cobbly, more shaly, ¹*Christinia*, ²*Ateleasma*, ³*Binnia*
⁴*Paleostrophomena* (#4 at base, all thin.) 80'

~~Athena like cobbly ls with chert in~~
~~upper half~~ *Lonchodonta* 50'

Covered (probably shaly ls.) 50'

Brown-watting impure ls with corals 50'

Granular ls with *Valcourea*, *Mimella*, *Gemma* 30'

Coarse, crumbly calcarenites, dark gray 8'

Mudstone 30'

Holston at quarry abounds in
Multicostella.

1.1 miles west of Friendsville on north
side road occurs exposure of the
coral beds with *Phymosops* and
Valcourea. All beds below
Christinia, I think, are definitely
of Chazy age and like the
Pychopteria - *Dactylogonia*
horizon in Oklahoma.

The *Valcourea* from the coral bed is
undoubtedly the same as the free
ones from 2 miles S of Philadelphia.

3.2 intersection } log of
3.4 Top Moshier } road 3/-1
3.68 Christiania } mile ¹⁴ NE
4.01 Top Lenoir } of Friendsville

October 29

12

Breakfast

0.45

Lunch

0.35

Supper

1.20

Lodging (Knoxville)

2.00

Section N side US 11, 1 1/2 miles SW of Philadelphia

Quarry beds of crumbly shaly ls
with *Maclurea*, *Valkourea*, *Mimella*,
Hesperorthia

30'-40'

Impure ls, thin granular partings
with *Rosticellula*

5'-10'

Mosheim-like lithology grading
down and/or laterally into ash
weathering lumpy - platy calcareous
mud-rock - the two types ~~not~~ forming
facies. No typical Mosheim

T25-26

10'

T27 - On E side road, 1 mile SW of
Philadelphia occur ca. 100' of compact
dense gray limestone with *Maclurea*
and *Opencella*. This is followed by
Holston-like marble and shale. I think
all this Lenoir is below *Christiana*.
The shale had a small *Hesperorthia* &
a graptolite. Chert in upper beds.
These beds all fit below *Christiana*
and correlated with cherty *Maclurea*
beds in section 3/4 mi NE of Fairview

T-28 - Just off Tenn 72 on loop 1/4
mile S. of Marble Bluff. Chert of
D. holdenii zone. Muffinsboro of
Butts. and Blocky chert zone of B. N.
Cooper's Blackford formation.

13.

Lower Lenoir at Lenoir City —
Measured along road by horses

- | | | |
|----|---|--------|
| 5. | Crumbly shaly ls., gray, fine grained <i>Machinistes</i> , <i>Minella</i> | 25-30' |
| 4. | Buff gray weathering silty dolomite
Conchoidal fracture | 30" |
| 3 | Mostly covered but up 2' thin crumbly
Dolomitic shale | 5' |
| 2 | Earthy shaly. ash gray ls. with
<i>Rostrocellula</i> | 18" |
| 1. | Mosheim type, drab gray wavy bed, snails
Dolomite | 4' |

Section in old quarry near Creek

Crumbly shaly ls. with <i>Machinistes</i>	25-30'
Thin silty "dolomite" (possibly silty)	30"
Shaly drab gray dolomite	6'
<i>Rostrocellula</i> bed (T-28)	2-4"
Mosheim type	9'

Total thickness of Lenoir as indicated along strike from Lenoir City to Concord is in the neighborhood of 150'.

Cooper & Edmondson agree that Mosheim at Mosheim is not necessarily the same as the

14

Mosheim-like beds at Philadelphia and Lenoir City. The beds at the two places do not look alike. At Philadelphia the Mosheim was not a continuous deposit but the Mosheim lithology was apparently appearing in earthy calcareous, shaly weathering beds. The presence of *Murchisonites* links the type Mosheim to the lower Lenoir.

Type Lenoir from what we have seen seems to consist of about 150' from top down as follows:

Firm fine grained gray limestone with *Murchisonites* and chert in the upper part. - - - - - 75-100'

Shaly limestone crumbling into small cobbles with *Valcouria*, *Hesperomithis*, *Mimella*, sponges and corals - - - - - 30-40'

Dolomitic shaly weathering earthy rock with masses or layers of Mosheim-like rock and granular layers and masses with snails and *Retriacella* - - - 10'

This is the type Lenoir and seems to be represented in Friendville by "Mosheim" shaly beds with *Valcouria* and corals, firm, Athens like limestone becoming cherty at top. This entire sequence extends up to Christiania but does not include it.

Check "Holston" from Jeff City and that Bridge collected at Mosheim level.

15

October 30

Breakfast
Lunch
Supper

0.60

0.60

0.75

Flint Ridge on US 25W, 4.7 miles SSE of Clinton, Beckmantown with 2' chert zone overlain by granular, gray ls. with red chert, followed by ash gray shale. Above this is blocky chert zone with numerous *Dinorthis holdeni*, *Lepidaria*, *Calliops*. Followed by mealy red ss. The *Dinorthis* zone is also underlain by mealy red rock.

Heiskel - NW of Heiskel. The Knox is exposed about $\frac{1}{2}$ mile along the road just S of the bend. Then follows blocky chert, red and yellow shale. Just before reaching the intersection dark gray limestones may be seen in the bed of a brook by the road. These are cherty and resemble the Strassburg of Va in lithology. They also contain numerous bryozoa. Above these and exposed along the main road at Heiskel are nodular shaly ls, yellow weathering that contain *Strophomena tennesseensis*. To the southeast a long section is visible. Just under the school, cherty limestones appear. Between the school and the brook, platy limestones with some shaly limestone occur which contain snails, *Optima* and a few other fossils. Just about opposite the first house on the west side of the road and a slight forward the school occur ledges with

16

Cryptophagmites. Across the brook in the bluff occur thin-bedded limestones with shaly partings and abounding in *Rosticellula* and *Byozoa*. *Opilites* is also present. Above the Rhynchonellid beds occur massive reds.

Along next NW road to the NE the blocky chert, red, meaty rock, Lincolnshire-like limestone and Otsego lithology occur.

Old Road extending NW for $\frac{1}{2}$ mile and located $\frac{1}{2}$ mile SW of Fearon Mill showed a wonderful section. The blocky chert occurs 245 paces NW of house and is overlain by red shaly rock. 132 paces SE from first stream & road crossing occur *Oligorhynchus* in a thin bed. *Mimella* is also present. This bed is located about 475 feet NW of the house. The *Oligorhynchus* bed is interbedded in yellow shale that in turn is interbedded between layers of the meaty red rock. Also interbedded in the red are layers of hard fine-grained sandstone, and calcareous shale, the latter with many *Strophomena* (suggesting meekeri). In the sandstones occurred *Wimothia willardi* and a possible *Sowerbyites*. Following these beds and on the south side of the small creek near the house occur the cherty, dark limestones with *Byozoa*. At the intersection of the old road and main NESW road and for 25 yards NW occur cobble shale and limestone with lower Otsego fossils. According to Cooper (B. N.) this is the real lower Otsego. The *Sowerbyites* beds are not Otsego at all.

17.

and this is proved at the locality north of Fountain City.

One mile SW of Mayer Chapel on the Fountain City sheet on the north side of the dirt road and on the slopes down to the creek occur dark limestones interbedded with occasional layers of yellow calcareous shale. *Dinorthis willardi* is abundant and occurs with a large *Camarella*. On the flat on the SE side of the road calcareous shale abounds in fossils: *Sowerbyites*, *Campylorthis*, *Mimella*, *Oligorhynchia* and *Dinorthis willardi*. These fossils are the same as those seen in Raccoon Valley, Liberty Hill, and just SW of Thorn Hill. They had been called lower O Horse but Ulrich thought them to be Strasburg. They seem to be a shaly equivalent of the Strasburg. The latter formation traced SW to Edison was followed with ease but we lost it between Edison and Thorn Hill. The probable explanation is that it changed to shale and has a different fauna in it.

Overlying these shaly beds in Beaver Valley occur dark cherty limestone abounding in *Nidulites*. This is B.N. Cooper's Ward Cove formation and clinches the Strasburg = Lincolnshire position of the so-called lower O Horse beds = Thorn Hill fm.

October 31

18 Breakfast 0.45
 Lodging (Kingsmeyer Hotel, Monistown) 2.50
 Lunch 0.20
 Supper 1.50

Morning visited type section of Whitesburg 2 mi. SE of Whitesburg. Here some rock at the base has somewhat the appearance of the Mosheim but the section is mostly crumbly nodular ls with many *Trachyites*. Also present are large *Rafinesquina*, *Valcouria*, etc. The upper third the rock is somewhat brown weathering and has some sponges.

The Whitesburg overlies the Lenoir and is a smooth dark gray or granular dark gray limestone abounding in *Favosites*. *Ampyria* was seen at the base, also big *Chonetes*, *Opikina*. Near the top of the sequence the rock is very cobbly, breaking into small lumps. In this condition it resembles the Chambersburg.

Visited the RR cut at Otas but saw nothing new.

Went on to Rogersville and from there to Thorn Hill. At base of section is a thick Mosheim which is overlain by Holston lithology. Where the bridge occurs at the bend, cobbly, shaly ls occurs with *Cystids* and *Dinorthis willardi*. We now believe this to belong to the Strasburg and that it is definitely not Otosee. Above this is a marble and then another shaly interval with *receptaculites* which Cooper believes is his lower Otosee. This is followed by a third marble and then corals of his Wardell formation appear.

19.

After seeing The Thorn Hill section we went down to Washburn and then over to Liberty Hill. At the bend of the road just before reaching the west end of the village occur Up. Otsee. Lower Otsee appears on the east side of the village along the highway about $\frac{3}{4}$ mile. Here also occurred below the Otsee cherty ls. of the Lincolnshire.

We returned to Thorn Hill and spent a short time at a cursory examination of the Evans Ferry section. At the base occurs a Madison lithology which is followed by red green mottled rock and this is succeeded by cherty limestone with *Mimella* and *Dinorthis holdeni*. This is followed by dark gray limestone with more scattered chert and big *dinorthis*. Above this, just below the side road, occur cobbly shaly, yellow limestone with *Strophomena megalis*, *Dinorthis willardi* and *Multicostella* (or *Campylorthis*). This horizon is not the Otsee but is the Strasburg as Ulrich contended. This is followed by a marble and then comes lower Otsee with *Receptaculites*.

The Upper Otsee occurs by the large white house and consists of cobbly ls. and heavy beds of limestone with *Camarilla*, *Hesperorthis* and *Campylorthis*. Around the bend to the south of the big white house is the so-called ~~upper~~ Lowville or written of Cooper (C. N.)

November 1.

20

In Raymond & Willard's brook
 Otsee at base of shale above
 lowest marble quarry N. of
 Luttrell = Stratburg shale
Petrocrania cucatridula
Rafinesquina duplicistriata
Schizothron cuneatus
Dinorthis atavides must be
 reexamined. Willard's figured
 specimen looks most like
 the species I am calling *D.*
willardi.

Between 2nd & 3rd marbles near
 Chesney = Lower Otsee
Hebertella melonica

0642

21

O'Hare - Liberty Hill, N of Luttrell
Dalmanella trogata
Plaesiomys elongata

O'Hare at Fugates = Benbolt + Wardell
Plaesiomys brevis
Dinorthis quadruplicata
D. transversa
Pionodema globosa
Strophomena tennesseensis
S. inspeciosa
Camalotectia quadruplicata

22

See collection from Lowville of
Slatton, Russell Co. Va. in
Butts coll.

Curdsville
Eggleson
Beatonville
Witten-like
Tyrone
Zygospira

Hagan section on Rose Hill
gravel.

Lenoir, Catawba Valley = Athens

-T42 November 1

Breakfast

0.60

Lunch

0.50

Supper

1.45

Moccasin
Pionacene
Nealmont of K

-T41 U.S.

Chert
Camarotoch
Cryptophagus
Witten
Strophomena
Heoparce
Goniatites

Along 58 east of Cumberland
Gap the Lowville we collected
from is Witten. ~~The Phillips~~
~~beds are Moccasin~~

Panther of
Bealville
Lowville
Lithology

Vaughanite with thin red ls.

Tetradium cellulatum along E leg of Y

Cherty
Lower type
Nodular chert
Real Moccasin
type

= Perry-multicostella (Campylodonta) snails =
Murfreeboro

Cherty
Lower type
Ropey-nodular
chert

Top at prong of Y
on R.R.

Moccasin type

X-T-40
Blackford

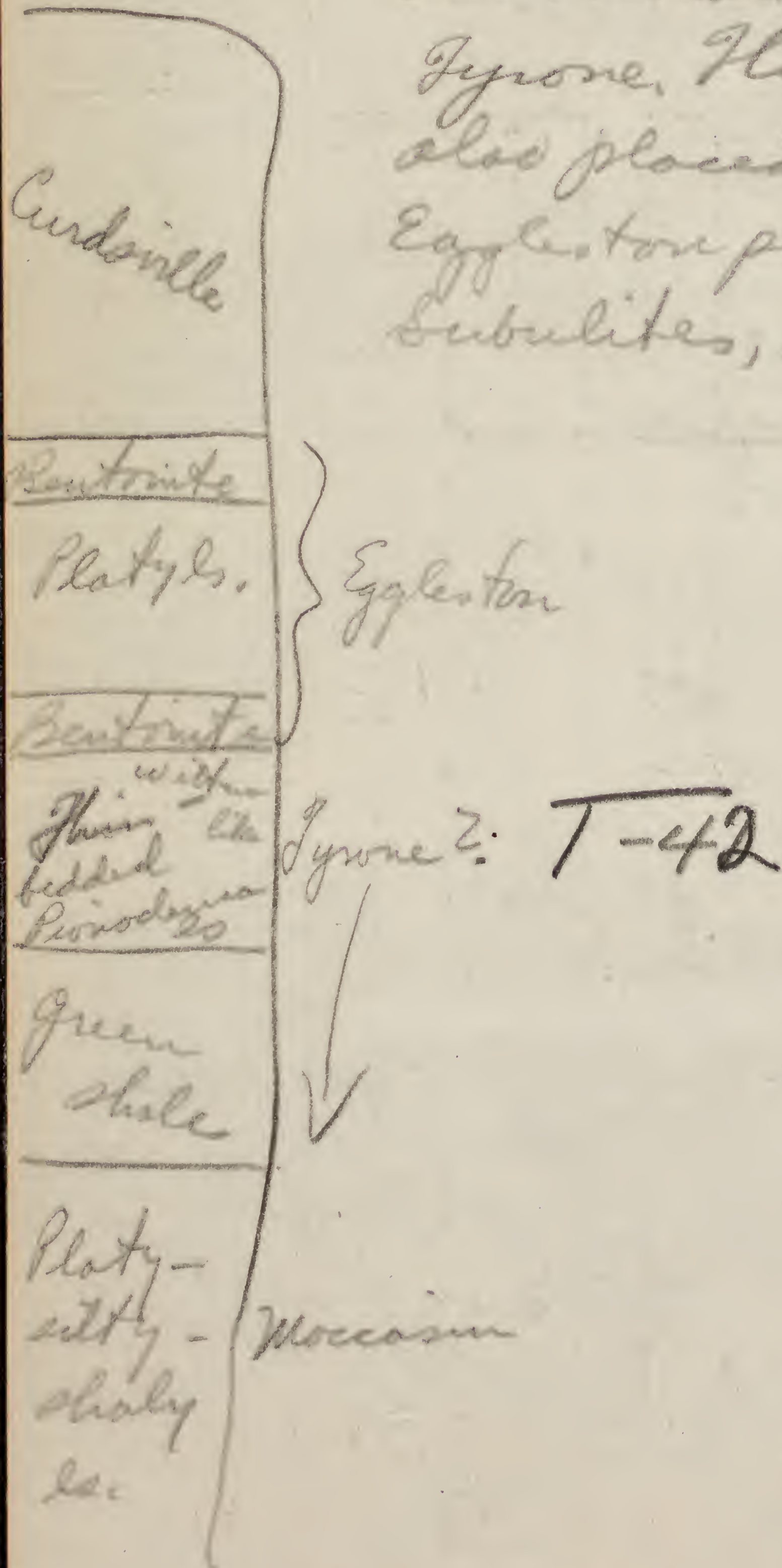
-T40

Over

Lodging (2 nights Cumberland Gap)

4.00

At upper end of section ~~is~~
 at water tower occurs Curdsville
 Under this is a 3 foot Bentonite, then calcareous
 mudstone (30-35') bounded below by
 another thick (2') Bentonite. This interval
 is said to be Eggleston. Below this
 is thin platy fossiliferous ls. abounding
 in *Pionodonta* and said to be
 Tyrone. The green shale is
 also placed in this interval. The
 Eggleston produced few fossils:
Subulites, *Strophomena*.



23

Yellow Branch section - lower portion seems to be definitely related to the Blackford. The contact with the Knox is just N of the side road to the west that goes down to a house in the valley. The top of the Blackford is about at the 8' marble that yielded my fossils. The upper part of the sequence is in cherty granular ls. The 8' marble lies under Mosheim-like rock. No typical Mosheim here.

Section at quarry about 1/4 mile S of Va 58 on Statins Creek, 2 miles out Stroma road 1/2 to Corp east of Cumberland Gap, west edge of Wheeler Twp, Va.

Stromatocium bed 80' stratig, above red bed at Ay to S. toward RR.

Crumby thin-bedded gray ls. shaly at base

Hesperornis and Opikina ----- 4'

Dark gray ls, Stromatocium, ^{Protorhyncha} Tetradium -- 10'

Dove gray vanhookite, Tetradium, Protorhyncha - 2 1/2'

Jaupé gray vanhookite, J. cellulosum - - - 6'

Massive ls, shaly partings, armed cracks at base

9'

The Opikina slabs suggested Ridley and the Protorhyncha clinch it. This is the upper Wardell of Cooper & the Hesperornis zone at Rye Cove

Important feature in this 84' is occurrence of Proto-
rhyncha and Tetradium
cellulosum.

Section at Hagar

Up. Bentonite	3'	
Chiefly arg. gray ls.	36'	
Lower Bentonite	2'	
Dove ls. (Pronodina)	38'	
Green gray ls	61'	Dove gray calc. type 33'
Bentonite	1'	
Green shale	12'	
Moccasin	345'	yellow weathering mud rock
Chert zone	63'	Perrinites at top.
Ammonocharia	127'	Cyrtophragmus
Basal Witten	35'	Tetradium Top of Wardell
<hr/>		
Cherty dark ls.	5'	Stromatolites
Shaly zone ^{vaughanite}	82'	partly gy horizon ^{Tetradium}
Calcuttye	36'	
Red bed.	2'	
Vaughanite	11'	
First red bed	3'	
Slabby vaughanite	200'	Tetradium cellulosum
Covered	60'	
Cherty Lenoir ls	59'	Murchisonia fossils
Mosheim vaughanite	65'	
Granular cherty ls	98'	= Butts Lenoir = Cooper
Arg. calc. type	35'	
Blackford	143'	ls. + dolomite

0645

November 2.

24

Breakfast

0.60

Lunch

0.50

Supper

0.75

Eggleston includes the green shale,
thin-bedded ls and two bentonites
plus about 5' above top Bentonite
The Pholidops is in lower Ludaville

Returned to Hogan section with
Ralph Miller. Collected *Fasciella*
and *Protolyncha* in and below
Stromatocium, also saw
Hebertella above *Stromatocium*.
Collected in cuts along US 58
but collected few fossils.

25

November 3

Visited Rye Cove, section going N from intersection near school shows a good Blackford sequence at the base in which B. H. Berger collected *Dinorthis holdeni*. The Ward Cove is present with *Nidulites* and also an *Oxoplectra* like *O. holdeni*. Possibly same as at Fountain City. Above Ward Cove comes the Benbolt here a shaly ls. and the lower Otsego of Rye. This contains the large *Rafinesquina*, *Strophomena* and *Plectocamera*. It is the horizon at the Birch Church. Collecting from all the Otsego beds was very poor. The Wardell or upper Otsego is not separable from the Benbolt but is present at Carvers Run. This is closely associated with *Stromatoceras*. Above it were found large *Opikina* very much like *O. insignis*.

In afternoon visited section at Mannville school on east side Clinchport Road. The section is in Wardell at the school.

Alabama

Leicester
up. Lenoir



Little Oak

athens Black shale

Whitabury
Daphniphylla + Christinae
Lenoir

Daphniphylla + Christinae

Lower Lenoir

Knox

Knox

up. Lenoir

Chamberlain

Christ.

L. Lenoir

Athens
Whitabury
Lenoir

Knox

?

0647

November 3

26

Breakfast

0.60

Lunch

0.35

~~Supper~~

Folding (Big Stone top).

2.00

The Porterfield quarry reefs
may = the Strasburg in a
greatly changed facies. The
Upper Lenoir at Knoxville may
be the cobbly (Chambersburg) facies
of the

Nov. 4

Lunch

0.45

2 Keys

0.20

Sent Coop. Eaton's paper on
By-passing.

Nails + tags for keys

0.25

Went to Fugate hill section
where a long sequence is exposed
along the road to Mandota over
Clinch Mtn. Collecting very poor
in O'Hara.

Returned to Tumbey and here found
Red beds of Blackford overlain by
limestones with the Blokey chert. These
contained also many *Misella*. Above
came ls. with *Spirifer* and then
ls with *Duorthia altavides*. No
typical Lenoir was seen but the
upper part of the Blokey chert zone.

Rye Cove

27

is somewhat shaly and crumbly and suggests the Lenoir lithology. So far it seems as though the Lenoir is represented by the red beds of the Blackford.

In afternoon collected near Hansonville but found the collecting very poor. At Green Valley Church crumbly ls for some 20' yields large *Epikina*. These beds suggest a transition to Ward Cove type of rock but Cooper insists these beds are Bentolt.

In conversations in the evening Cooper held entire range of Oxoplecia to = Lower Echinophacites and to = Shippensburg.

Otosee { *Epikina*, *D. transversa*, *Oxoplecia* } Lower
Athens { *Oxoplecia*, *Epikina*, *Leptellina* } Echino-
 { Whitesburg } sphaerites

Nodular facies { Bentolt - *D. transversa*
 Echinophacites
 Peery
 Ward Cove } *Oxoplecia*

November 5

28

Lodging (Lebanon, 2 nights)	4.00
Supper (Oct. 3)	✓ 1.00
Breakfast (Oct. 4)	✓ 0.50
Supper (Oct. 4)	✓ 1.00
Breakfast (Oct. 5)	0.60
Lunch " "	0.15
Supper " "	1.60

Spent morning at Portfield quarry. Cooper claims the so-called Leno is actually Lincolnshire. The Holston is believed to be Ward Cove.

On yellow Branch about 3 miles west of Meadow View and 500 feet downstream from the junction of Co. Hy. 745 and Va. 80. The section is along Va. 80. Above the Beepmantown occurs coarse ss followed by red sandy limestone. This limestone and the sandy limestone up to the road to the barn, perhaps 40' of limestone with *Porosticella minima*. Above this are 8-10' of sandy dolomite then 20' of sheared ls. with many snails including *Maclurella*. On this is a band of dolomite after a covered interval. Then comes a conglomerate, sheared, but with many snails.

29

The vangharite is followed by dolomite and magnesian limestone. The upper part of the section is much sheared light blue gray ls. This was called Lincolnshire by Cooper but he is not sure of it. The Mosheim may be 5-Oaks. The lower beds from the Gastropod (nautilites) zone down to the Berkmanstown seems definitely to be Lenoir. The upper limestone contained no chert.

Here the vangharite seems to belong rather to the lower than to the 5-Oaks beds & may be Lenoir.

The lowerbyella (small) seems to link the Lenoir at Porterfield to the Lincolnshire, & it certainly would make it post-chazy.

November 6

30

The Christiania beds at Athens & Riceville must be at base of Upper Lenoir (Christiania zone) of Friendsville.

We agree that the upper Lenoir at Friendsville equals all the Athens at Charleston and Athens. In other words the Christiania beds above the Lenoir at Charleston plus the shale and nodular beds equals the Christiania zone at Friendsville. These two sequences are equal to the Whitesburg. The Strasburg may be equivalent to the few cherty beds at the top of the lower Lenoir. The coral beds thus would be the top of the Lenoir.

Marion Ory

35± yellow shaly, knotty ls. with Knoxville fossils } Whitesburg

8' Knotty solid ls. with nautilites

Mosheim 35'(ca)

Knox

31

590

2:38

3.12 miles

on US 11 from
counthouse in
Marion = T 75

Athens

shale

Knobby
shaly
lslike up
ferrous
in gray
above

225'

Dense ls., gray with
75- Machinates in lower 25'
shown in gy.

3

25' Coarse granular calcarenite
some reddish, abundant pebbles
chert + quartz - Rostricellula etc.

2

Calcarenite with ~~pebbles~~
in upper part, light gray -
pinkish, occasional chert pebbles 12'

1

Partly covered to dolomite

Coarse calcarenite 25'

3/4 mi N of Area Ceres

Martinsburg.

25' Moreasin

Watten, Wardell out

Bembolt 125'

Opikina, Minella

Lophospira (Perry)

Ward
Cove

~~300'~~ Knotty chambered, like rock,

Nidulites, Echinospira, cup coral

300' Ward Cove lithology, athers
in position

Calcarenytes (McNutt) 35'

Lincolnshire coarse grained ls.
intercalated with cherty ls.

Mosheim 20'

Blackford 2-3'

Knotty ls. = Lenoir 55? 15-20'

Knox

32

State Highway #2 from Eggleston
to Newport - very scenic.

Junction of Va. hwy. 100 and #2
at Staffordville Contact of
Blackford just S of Bridge over
Walker Creek. Lowest beds a
conglomerate followed by dolomitic
rock with *Camarella* and *Bygonia*.
Over this is a sh. gray shale and
blocky chert, often interbedded.
This is followed by about 175'
of *Trinobolus* with *Dunorthus*.
Above this is Ward Cove with
a Chambersburg lithology and
containing *Nidulites pififormis*.

Upstream along N + W RR along
New River 1/2 mile upstream
from Burton Sta, on Beckmantown
are 90' calcarenites overlain
by 100' of *Trinobolus* with
Dunorthus & *Sowerbyella*.

Breakfast	0.60
Lunch	0.15
Supper (Christiansburg)	1.50
Lodging (Marion, Va)	2.25

0654

November 7

33

Breakfast	0.70
Lunch	0.45
Supper	1.60
Lodging (Natural Bridge)	2.50

1/2 mi S of Denmark Church on
a (east) branch of Purgatoire
Creek.

75'	Martinsburg	
	Martinsburg?	zygospira oboloides
	Cyclonema	
	Pirothis	
	Transverse	
	Athena	
	Echinospira	
40-50'	Whiteburg	Echinospira
	Strasburg	Sowerbyite
200' ±	Mosheim	(thin)

34 3/4 mi NW of Rocky Point, Va
for unusual Lingulid. Basal
beds of New Market (Blackford)

Athena { Junction Co 675 and Va 257
at crossing of Buffalo Creek,
Must 125 Coarse calcarenite, light gray, many
bygonia
Lincolnshire Cherty blue gray weathering
dark ls. Report this 120'
Mosheim 30' (some chert)
Knox

November 8.

35

Breakfast

0.60

Lunch

0.45

~~Supper~~

1.50

Lodging (Stanton)

3.00

Went east of Lexington to examine Chambersburg. Found no lithology referable to Chambersburg. It is all of Athens type. Discovered two infolded masses of Martinsburg that may be the reason for the great thickness of Athens at Lexington.

Went to Whistle Creek, NW of Lexington. Lincolnshire chert is overlain by Murat light gray calcareous ls with few brachiopods. Whitesburg brown-weathering, hard knotty ls. with dark sandy shale parting 5 and some chert, overlies the Murat and is followed by Athens.

0657

November 9

36

Breakfast

0.60

Lunch

0.55

Supper

1.55

Lodging (2 nights Harrison)

3.00

My specimens of *Conotrachelus* (Schubert)
 from Lacey Spring are from
 Lower Athens. About $\frac{3}{4}$ mi.
 NE of Melrose Cavern. It is
 about $1\frac{1}{2}$ - 2 mi. SW of Lacey Spr.
 on U.S. 11.

Junction Va 263 & Co 710 at Grand Ledge
 5.05

Base of up. granular 5.09

U.S. 11 at Mt. Jackson 7.75

Cedar Grove Church 11.28 =

3.53 miles S of

Cedar Mt. Jackson on Co 616.

N 79° W

Cir. Hy 616 & U.S. 11 - 71.75

To the Lenoir

71.85

71.78

72.80

72.10

.72

0658

37

Nov 10
Send BHC a copy of
International Rules of
Nomenclature.

Breakfast
Lunch

0.60
0.20

According to Cooper Kay's
Tiger-stripe is blackish red.
The overlying variegation is
5-Oakb.

Change 4 miles E of Hamsworth
on US 33 to

Between Peales X-road & Run
Laird, N of Cut Run on US 33,
5 miles SE of Hamsworth

41.27
 42.10
 1.95

85.32

120
 85.32

34.68
 30

34.38

Handwritten notes and a diagram. The diagram shows a vertical line with a horizontal line intersecting it. To the right of the vertical line, there are several horizontal lines and the word "Measure" written vertically. Below the diagram, there is a large handwritten note: "Measure = Whitehouse".

Va, Ga, Tenn, Ala
1945

1947

September 25 - Purchase \$5.50 in Travelers
cheques 4.13

Car I 7768

October 1. Mileage when car was taken
56904.

Change oil, grease car SVI 2.75
Mileage 56998.

2 blocks of Cybeloides to etch from
N of Edinburg.

Lunch Woodstock, Va 1.15

SVZ Gas 9 gals Staunton (57074) 2.15
Supper 2.45

Drove from Washington to Strasburg
Left Wash. at 7:45 arrived Strasburg
10:15. Had car greased and
headed for Woodstock. Met Carl
Dunbar on highway and Cooper
at Woodstock, at 11:50. Took
Wang to Hupp Hill where we saw
Lambecophyllym and Platycystites
just below top of hill.

Lunched at Woodstock and
then went to Bowman Farm. From
there went on to locality opposite
dam on Shenandoah River. Here
we saw "Mosheim" with dark
granular fingers of "Tenois". This
is followed by Tenois with
Dinorthis ataboides and Bowerbyia.

(2)

in lower part of the middle. Above this in top of middle Lenoir occur *Cybeloides* in some abundance. We took two blocks for etching. Lenoir is followed by a granular ls. said by Bette to be Whitesburg.

The Chambersburg comes in with *Renssella* and *Conionthis*. This zone we traced clear up to Markin, Pa. where the *Conionthis* lies over the *Tetradium cellulosum* beds of Towville of Stone. This puts the *Egyptophragmus* way above the Towville.

A *Nidulites* was found loose that must have come from Lenoir or basal Chambersburg, both unusual occurrences.

Whistle creek may interfinger with Mosheim type rock.

Oct. 2

Breakfast

-1.25

Room & garage Nat. Bridge SV3

-4.50

Mileage 57122

Lunch Blacksburg, Va

-0.95

Gas Pearisburg Va 11 gals

-2.43

57245

SV 4

Supper Bluefield, W. Va

2.20

From Natural Bridge through the narrows to Bluefield for the night. Section at Narrows showed

1.25
0.95
2.20
4.40

157
105

(3)

Musheim type limestone overlain
by calcarenite sandwiched
between the Ticoleshire and
blocky chert.

Oct. 3. Breakfast Bluefield — ~~1.24~~
Hotel 1 night " — SV5 ~~5.10~~
Car storage ~~0.77~~
Gas Lebanon Va, 7 gal. (SV6) 1.53
Mileage 57361
Supper Big Stone Gap ~~1.75~~
Lunch ~~0.70~~

1.24
1.75
0.70
3.74

Left Bluefield for Fagerwell, Va
where we saw one locality
in Witten, then went on to the
Tumber section. From Tumber
went to Hagan School section
and made a short stop at beds
just east of Cedar Point School.
From there went on to Gate City
and Big Stone Gap.

October 4.

Hotel Big Stone Gap ~~3.00~~
Breakfast ~~1.20~~
SV7 Gas Middlesboro, Ky. (57493) ~~2.10~~
Lodging, Middlesboro Ky. SV8 4.00
Supper " " ~~3.10~~

1.20
3.10

Visited Hagan section and
quarry on Station Creek.

④

October 5

1.20
1.10
2.35
4.65

Breakfast, Middleboro, Ky ~~1.20~~
Bus, Crossville (57640) ~~2.44~~
Lunch ~~1.10~~
Supper ~~2.35~~
Arrived Murfreesboro at 5:30 PM

Oct. 6

Walter Hill

(50)
A - 4" dove ls. with bygonia
B - 4-6" granular shell breccia
C - 5' thin bedded ls. with
numerous fossils Protozyga,
Murella a, Opikina, Strophomena
Glyptothiris Plates up to 4" thick
Often granular coarse
D - Thin bedded dove ls.
d weathering ashy gray. Fossils
scarce

Murf.

The Ridley above the Pierce
 is very heavy bedded ls. about
 35-40' thick. Lower beds
 crowded with a small *Optunia*
 and also *Camarella*. Upper
 beds here with *Zonoceras*
 and *Endoceras*, also *Maclureites*.
 The rock is brownish gray
 with *Camerocladia*-like
 or worm markings which
 weather yellowish. Ridley
 weathers ash-gray. *Stromato-*
cerium in small heads, often
 upside down. Cooper likens
 this Ridley section to Upper
 cherty Beurbolt. *Dystactospongia*
 is fairly common.

1/2 mile East of Readyville on
 US 70S. On road at bend
 granular, massive layer
 with *Cryptophragmus*. This
 bed occurs on hillside 150 yds
 south of highway. ~~Bed~~ *Crypto-*
phragmus bed about 3' thick.
 Above *Cryptophragmus* occurs
 platy ls. with abundant
Leontocyella. 20' above
Cryptophragmus comes the
 double bedded bed the same
 as at Fairview Station at
 Rome. About 25' of platy
 ls. with *Camerocladia* occurs

below *Cryptophagnus*
Oct. 6

Breakfast

1.20

Lunch

1.10

Car repair

9.00

Supper

2.40

1.20

1.10

2.40

4.70

Lowerbyella is very abundant
just above *Cryptophagnus*

0.8 mi. East of Leadville at
junction with Clint road saw a
section of Carters showing
about 65' of rock. Lower beds
massive and with *Tetradium*
cellulosum. A Bentonite comes
30-35' below top and under it
we saw *Strophomena*, *Strophomena*,
Zygospira.

Above the Bentonite the beds
are more thin-bedded and
varied with some coarse
granular ls., dove ls., and
some hard silty or dolomitic
beds in appearance.

The base of the Carters comes
25' \pm above the *Doleroides*
Zone of the upper Lebanon.

⑦

October 7-

Breakfast

1.10

Lunch

1.20

Supper

2.25

Gas

4.55

2.08

Marshall Knot in morning.
 Columnaria at base of Ridley.
 Afternoon collected Lebanon
 on US 41, Heritage of
 Woodbury.

October 8 -

Breakfast

1.20

Lunch

1.20

Gas 6 gals \$7.89

1.51

Supper

2.20

Law section at Kittell.
 Low. Lebanon has Hesperorthis
 here.

Went over Cutlers-Tyone
 0.8 mile east of Readyville.
 Tetradium very abundant in
 lower part of section. Saw
 a large Camerella suggestive
 of Plattin. Beds just under
 Bentonite with many
 Camerocladia-like branchings,
 also Doleroides, Strophomena,
 Opikina all suggestive of
 the Lebanon. Tyone beds are
 thin bedded but formally like below

(8)

0666

Oct. 9 Breakfast

1.20

Lunch

1.25

Supper

1.40

Went to Nashville and collected on W side of city. Mayssville about 3.6 miles E of Junction of US 70 N + 70 S Waldron at Person Ay, 2 mi E of Pegram and opposite Hidden Lake.

Afternoon collected Mayssville + Richmond on US 70 S $1\frac{1}{2}$ + $\frac{3}{4}$ mi. E. of Junction of US 70 S + 70 N. Collected Arnheim on N side US 70 S about 7 miles W of Nashville City limits. Returned to Murfreesboro for night.

Hotel Murfreesboro

15.00

Oct. 10 -

Breakfast

~~1.30~~

Lunch

~~1.00~~

Gas 58014

~~2.20~~

Service car

~~1.00~~

Hotel Murfreesboro

~~3.50~~

Stamps

0.30

Supper

2.25

Stopped at Rome to see Lebanon - Carter. Bentinck below Ly pond is mentioned by Fox 1944. Minella occurs in Ly pond but a Cornella like

Write Car ton about
Mexico coral.

2.30

2.25

4.55

(9)

species described by Fenton
from Plattville occurs in
beds below the bentonite

Cabin then Oct. 13 13.00
Gas Knoxville 58210 2.92

October 11-

Breakfast 1.20
Lunch 0.50
Supper 1.80

Went to Friendsville to see
Lenoir section. Worked one
mile east of Friendsville and made
an effort to get a collection
above the Maclure bed. This
rock is moderately cherty, the
chert weathering out in small
masses. Sandy chips also
weather out. Fossils are very
rare and show mostly in the
form of trilobite fragments
but recognizable specimens
are very rare. A few small
brachiopods suggest the lower
Athens which here has turned
somewhat cherty & cobbly.

In afternoon went into
creek & collected 5 of 7 friends
church and in the field SE
of the church. Here *Comarella*
longirostris is present above
the Maclure as well as below it.

(10)

While collecting Christiania an old colored man recommended that we collect at the old colored cemetery. Here fresh graves showed an abundance of Christiania and the beds some 50 yards SW of the cemetery yielded Birmania, Paurorthis, Isophragma, Orthambonites, Paleostrophomena and Apatomorpha. This is an assemblage exactly like that at the locality $2\frac{1}{2}$ miles SE of Riceville.

October 12 -

	Breakfast	1.25
1.25	Lunch	1.40
1.40	Supper	2.30
2.30	Regs (5)	0.50
4.95	Gas	2.06

Went first to Miser Station to collect Levier. Here shaly rock produced Paurorthis, Captonotella, Oxoplexia (small) an assemblage like that occurring in the marbles. We think it is probably Fellies in age rather than Levier (Ottawa). Afternoon collected at Friendsville.

(11) October 13 -

Breakfast —

1.25

Lunch —

1.10

Supper —

2.45

Rd. Taxes —

0.20

Visited Heiskell and measured section near Fleason Mill. Collected rhynchonellid beds in gap south of Heiskell. These beds are Moccasin or possibly the Eggleston equivalent but more probably the former.

Afternoon scouted for other exposures and found a long section NE of Fleason Mill about a mile. Here above the reds and thin cobbly beds of the *Oligorhynchia* horizon granular cherty limestone produced large *Nidulites*. Thus this horizon proves to be the Ward Cove. We also discovered Wardell fossils in the upper part of the Benbolt and in the limestone overlying it. The section here is thus

Benbolt
Granular l.
Ward Cove
New form.
Elway
Blackford

—
Moccasin
Watten
Wardell

(12)

October 14 -	
Breakfast -	1.00
Lunch -	1.00
Supper -	2.50
Gas -	1.30
Cabin for Oct. 14-15	6.50

In morning went up to Fountain City and there found marble overlying the Beckmantown and followed by Dinorthis-bearing limestone, blue gray granular. The Dinorthis looked like *D. willardi*. Overlying this comes cobbly ls. with *Oligorhynchia* and *D. willardi* & other fossils in abundance. On top of *Oligorhynchia* comes the Ward Cove.

From Fountain City we went to Chesney and found some 50' of gray granular limestone overlying the Beckmantown and underlying *Givaneella* beds at the base of a thick marble which underlies the *Oligorhynchia* beds.

From Luttrell we took Tenn. 61 to Tenn. 33 and looked at the Witten-Moccasin-Eggleson section about 5 mi. NE of Maynardville. Witten passes into Moccasin which is apparently the same as the *Pionodema* beds at Hogan.

(13)

These really should be called Moccasin. The Eggleston occurs above the thick bentonite and below the Curdsville.

After lunch went to Evans Ferry section. Found Elway under *Oligorhynchia* beds. Could not confirm presence of *D. atavodes* between Elway and *Oligorhynchia*.

October 15-

Breakfast	1.10
Lunch	.83
Supper	2.35
Gas	2.60
Car repair	6.20

In morning went to Maryville to ship beagl. 7 kegs sent off weight 505 pounds.

Went southwest of Maryville on U.S. 411 to junction with U.S. 129. On U.S. 129 saw Knox and Athens in contact. The basal Athens contained fossils of the lower Christianica zone including the trilobite *Arturochela*. Went through the Athens and Tullahoma to see sandy series and then the red Beds. The latter contained a large *Lingula*.

(14)

and yellow sandy shale
with *Pionodema* I. The
horizon must be Wardell-
Witter. SE

After lunch saw Athens
3/4 mile NE of Mint. Here just
above Knox are 75' of sandy
shale with *Christiania* and
other "Lenoir" fossils. Above
this is a long sequence of
Athens with graptolites. The
Athens consists of silts and
fine grained sands in lenses.
Some of the layers are
distinctly flaggy and the
graptolites extend through a
long thickness.

Saw Jellies 1 mile N of Old
Kagley Church where *Cyrtosotella*
Aerolichas and *Orthambonites*
were seen. Drove into
Moccasin Then went home

(15)

Bridge Toll

0.30

October 16 -

Breakfast

0.80

Lunch

1.00

Supper

1.45

Cottage

2.50

First visited section about 2 miles SW of Philadelphia to see Lenoir. Went up hill on S side road to see upper Lenoir. Lenoir is probably 150' thick. Above it comes about 200' of pink marble which is probably the Holston and is in the position of the "Upper Lenoir". Shale succeeds the marble.

After seeing Lenoir we went down to Sweetwater and took Madisonville road to SE. Saw Athens with trilobites about $4\frac{1}{2}$ miles SE. Then thick Jellies above it. In Jellies saw and collected from a cobbly bed containing *Dinorthis*. This is the same bed as Butts collected at Misen.

$\frac{1}{4}$ mile N of Christiansburg saw some 25-30' of limestone underlying Athens shale. Limestone contained large *Sowerbyites*, *Bygonia* and *Leptellina* and probably belongs with the Athens. The Athens is the same as that NE of Christiansburg seen last year. Drove through section southeast of Christiansburg but added no new information.

The big *Sowerbyites* should be checked as a possible Lenoir fossil. The specimen of *Sowerbyites*-like shell found by Wang in the Billingsburg zone should be examined in this connection.

(16)

Finished the day at Athens, about 1 mile northeast of the courthouse. Here we saw *Apatomorphus* zone, which occurs on top of hill east of new quarry. The chert fossils between this zone and the Knox must be derived from the Lenoir as *Valcouria* was taken. The Lenoir in any event would not be very thick.

October 17-

Breakfast	—0.80
Lunch	—0.60
Supper	—3.50
Gas.	2.73
Cabin (Chattanooga)	3.00
58765 Oatcrash	

In morning visited section on Hiwassee River. Above Lenoir and below Athens comes an unknown thickness of shale which is overlain by some 12' of oolitic ls with black oolites. This ~~is~~ overlain by a foot of cream-colored granular ls. *Christiana* occurs in a sandy shale band in lower part of oolite.

In afternoon went to Riceville but this locality is now lost. Saw another locality of same beds only 150 paces from ~~Volunteer~~ a few miles SW of Riceville locality. Drove to Chattanooga for night.

(17)

October 18-

Breakfast —	1.30
Lunch —	0.70
Supper —	1.40
Bds —	1.97
Service car 58979	2.50
Room 2 nights Calera	5.00

Left Chattanooga early in morning and arrived at Birmingham about 10:30 AM. Went to Gate City to see Chicamunga ls. Here thick beds of fine-grained shaly ls. with *Diphyridia* occur at bottom. Middle beds thin-bedded, shaly with many fossils, *Oxoplectra*, *Campylorthis*, *Glyptorthis*, *Hesperorthis*, *Strophomena*, *Opikina*.

Above this come about 15' massive ls. followed by 2" of bentonite. On this are ca. 50' of calcarenite with *Dystactospongia*, *Columnaria*, and *Stomatocarium*. In upper part of this 50' bed comes *Cyrtophylus* near top with *Tetradium cellulosum*. Just above the 50' bed are 2-3' crumbly ls. with *Pholidops*. Then come granular ls. & platy ls. ca 10' which contain abundant *Sowerbyella*. This upper 10' may be Denton.

Cooper thinks 50' bed may be Carters.

(18)

October 19 -

Breakfast
Lunch
Supper0.90
0.50
1.50

Went to Pratt's Ferry, collected from Whitesburg and up. Lenoir. On latter found large Sowerbyites. Spent most of day in a vain search for quarry in lower Lenoir. Late afternoon saw Athens on west side of Calera.

October 20 -

Breakfast
Gas (Kilabaster)
Lunch
Supper0.75
2.60
1.15
3.003.95
4.15
5.104.15
4.95
5.10

At Pratt's Ferry 200'-250' of limestone looking like Little Oak or Lenoir. It had *Rhynchonella* and *Lophospira* and must therefore be Ordovician. This rock was vertical. It may be the other limb of a tight syncline so little Athens exists here.

Visited large quarry in Little Oak about 2 1/2 miles NE of Pelham. Here *Binnoria* were abundant near bottom. Little Oak rests on Lenoir here.

Made fine collection at intersection 2 miles NE of New Hope Church. At this place the Little Oak fauna corresponds to the Lower *Christiana* fauna at Friendsville and the *Christiana* beds at Pratt's Ferry. Drove to Rome, Georgia

19 October 21 -

Breakfast

Lunch

Supper

Hotel at Rome, Georgia

Gasoline

Tips (Hotel, Chattanooga)

1.20

0.90

13.20

4.50

2.00

0.50

Left Rome and went north on
US 27 to see localities visited
in 1939. About 15' yellow sandy
shale and thin ls. under the main
locality. This contains abundant
Fascifera. Above this comes some
20' of thin bedded ls. with shale
partings abundant in fossils.
These undoubtedly underlie the
Hesperidites beds seen on the
highway in 1939.

Went to see the section along
the highway south of Chocomaug
Creek not far north of Capt. Bop.
At the bridge over the Creek are
thin bedded ls., much cracked and
with Ostracods. On the highway
are hard limestone weathering
with a crust and suggesting the
Perry. Above these the section is
covered. Then comes a small
thickness of Musheim-like ls. that
Butter called Musheim. All below
this he placed in the Musfreesboro.
Above the Musheim are some
30'-40' of cherty limestone called
Ridley Lenoir by Butter.

Just at the road fork the
rock gives way from massive
limestone with chert to shale
and platy ls. with abundant
Fascifera and Retriellula. This
division is all of 20-25' thick.

Thin
Massive
Perry
Ostracods
Opilina
Fascifera
Ridley
Moe
Murphy

(20)

and is the same as the Fascifera beds on US 27. Above these beds come platy ls. with shale partings same as on US 27 but in addition some 15' of similar rock with Hesperorthus, Anostrophia and Erygia. I think this is same as Hesperorthus horizon on US 27. The combined thickness must be about 35'. Above the Hesperorthus beds are massive Camerocladia bearing ls. about 30' in thickness. Above this for some distance on road could be found fossiliferous plates of ls. with Hesperorthus, Sowerbella, possible Dalmanites or Pionodema. This is undoubtedly the Lebanon.

Considerable covered distance follows lost Lebanon seen but in a small stream about 3/4 miles south of Circumference Creek mud ls. of Moccasin type were seen. Some pure ls. in the mass contained abundant Tetradium. This is the Carter-Moccasin.

The written evidently includes Butt's Lenoir plus the Fascifera beds plus the fossiliferous layers through the lower Hesperorthus horizon. The remaining fossiliferous beds are Lebanon.

I think the big cut on US 27 is upper Ottosee of Rye Cove. Must examine other collections in area. I think all the rock up to the Fascifera beds belongs in the Murfreesboro. Fascifera is Paines.

(21)

October 22-

Breakfast	—	0.85
Lunch	—	1.20
Supper	—	1.90
Hotel Chattanooga	—	6.60
Toll		0.35
TVA maps		0.70
Car storage		0.75
Gas Athens, Tenn 59420		2.57
UPS		0.20
Cab in 2 nights (Knoxville)		8.00

In 1939 notes I state that I saw *Binnia* abundant 30' below top of Little Oak. On this trip we also saw *Binnia* abundant 5-10' above floor of quarry. The upper *Binnia* is large and should be compared with the smaller ones in the lower part. That I am calling *B. butti*.

Visited TVA for maps and saw map-making process. Drove to Knoxville in driving rain. Hard downpour in night.

October 23-

Breakfast	1.15
Lunch	0.90
Gas	1.68
Laundry (2)	2.72
Supper	2.35

Went to Marysville and shipped 5 bags.

Worked on section along U8 129

(22)

October 24 -

Write P.P. Fox for Ordovician fossils.

Breakfast		1.10
Lunch	4.39	0.94
Supper		2.35
Small Knife, Tacks & nails (Oct. 23)		0.90
Room Knoxville (1 night)		4.00

Ran section down through settlement called Six Mile. Lowest Athens a sandy bed, fairly massive overlain by shale. Saw no fossils lower Athens a black to dark gray sandy shale. Section begins with a sandy sandstone and terminates in a coarse calcareous ss. Series yellow slaty shale with thick ss in its midst. Moccasin reds occur near Six mile school contain a thick sequence of yellowish ss near top. A red Moccasin bed is overlain by black Devonian shale & this by Mississippian ss with *Spinifer* and *Tognifer*.

By on Tenn 71, $\frac{3}{4}$ mile NW of Lake Forest consists of coarse marble with *Multicostella*. Probably Vestal marble & is overlain by "Upper Lenoir".

Drove over Upper Lenoir where seen in 1939 just north of Shooks Gap. Here considerable work is shown over a large area. On north side of Shooks Gap Quad. north of Tennessee River the knob is overlain by 25'-30' of Moccasin-type of vaughanite. Above this come

(23)

some 50'-60' of blue gray somewhat shaly, granular ls. containing small fossils: *Opikina*, *Mimella*, *nucleus*, small *Valcouria*, sponge. This rock weathers to ragged shaly strata or plates and has a very irregular fracture. It is the Lower or True Lenoir.

This is followed by 100'± of cobbly limestone in massive beds that break into small cobbles when weathered. The limy cobbles are fossiliferous and contain *Christiania* in abundance. This "Upper Lenoir" is followed by marble and *Fellies* and the latter by cobbly, yellow "Ottersee".

October 25-	
Breakfast -	1.00
Lunch -	0.62
Supper -	3.05
Cabin at Cumberland Gap -	4.00
Gasoline 59702	2.54
	<hr/> 4.67

Hogskin Valley
Powder Springs, Ga., Georgia
At Mount Eger Church the church rests on cobbly yellow beds called Benbolt by Cooper. Just above these beds comes a second layer of cobbly yellow shale with *Fascifera*, *Multispella*, *Strophomena* and small *Lowerella*. Cooper calls these Benbolt also because of chert and false-*Camerocladia* near their top. Above this comes a light gray. Evidently the *Fascifera* beds of Liberty.

(24)

Hill and here are Top Benbolt or low Wardell. According to Cooper the Forasifera bed is up. Benbolt also because of small *Dystactospergia*. Benbolt is the lower + middle yellow cobbly band at the church.

Section at Rose Hill, Tenn.
Maynardville □, Tenn.

At base of section occurs a Mosheim-like limestone thought by BHC to be in the Blodgett chert horizon. This is followed by red beds and yellow shale with beds of earthy limestone about 90-100' thick. This is succeeded by cherty heavy-bedded limestone assigned to the Ward Cove. In the lower part of the red bed succession occurs gray granular ls with thin shale partings containing *Strophomena oligorhynchoides*. *Platycamara* was seen higher in the red-bed sequence.

Above the Ward Cove occurs a thin layer of vanhookite with *T. cellulorum*. This is followed by a cherty band.

After the chert comes thin bedded limestone with cobbly shaly bands belonging to the Benbolt. *Schertbilleria* was abundant. Above the Benbolt are platy ls. abundant in *T. cellulorum* and also containing *Ancistrohynchus* and *Hebertella*. This at the road intersection at Rose Hill School.

Above the road intersection opposite the lumberyard comes *Cryptocrinus*. Above this is Witten which is followed by *Moccasin* terminated by a bentonite. On the bentonite is nearly *Geleson* (20') terminated by the *Caldwell*.

(25)

Oct. 26 -

Groceries

Breakfast

Lunch

Supper

Gasoline 59889

Cabin 2 nights 26-27

Section at Glassco Store

1.20

5.21

1.10

0.66

2.25

1.43

8.00

Lower part of section consists of Blackford with a red-bed in the lower part. This is succeeded by Elway with Calappa and Lepidodendron. There occurs a sequence of dark cherty limestone containing *Oligorhynchia* in the upper beds. This is the Ward Cove. In this bed is a thick *Vaughamite* which is the base of the Otis of Huffman. This is followed by shaly beds with *Dimorphia transversa*. Above the Benbolt come Wardell & Witten followed by Moccasin. The lower part of the Ward Cove in this section contains *Salterella*, *Helicotoma* and two kinds of *Tetradium*. It is part of the true Murfreesboro. *Oligorhynchia* may thus be approximately Murfreesboro in age.

Cryptophagnum here ranged though about 200', the whole thickness of the Witten.

Saw an almost identical sequence on E side Va 70 about 1.6 miles S of Jonesville. Cooper thinks no blocky chert, all belongs to a new division equal to the *Oligorhynchia* horizon.

(26)

October 27-

Breakfast —
 Supper —
 Gasoline —

1.10
 2.25
 1.80

Went to Hagan to study cherty ls. at base of section. Here take cherty ls. down. This is true also pt. Walnut School on Wheeler. The lower cherty ls. had big *Speriditia* and fasciculate *S. hypomena* suggesting Elway. Then followed a thick calcarenite, possibly the *Oligorhynchia* zone. Then came the upper cherty zone but we found no fossils to prove it as Ward Cove. The upper chert at Hagan has many snail suggestive of Peery ls.

Oct. 28-

Breakfast —
 Supper —

1.10
 2.25

Left Cumberland Gap and went over to Lone Mtn. Here $1\frac{1}{2}$ miles N. of Lone Mtn. and on the Lone-Mountain to Jazewell road is a long sequence. About 1/2 mile north of intersection are rocks butte called Mosheim overlying cherty ls. representing the Peery Ward Cove sequence. On the Mosheim is a layer of cherty ls. overlain by shaly and thin bedded ls. containing *Dalmanites*.

(2) Large *Mimella*, *Strophomena*, *Soudanbyella* and *Mufletistella*. These are followed by platy ls. with *Dinorthis frankensis*, *Doleroides* and *Rosticellula*. On top of these are platy ls. with *Murchia* and *Rosticellula*. This is about the boundary of the Benbolt + Wardell. Up Wardell has a 40' calcarenite bounding in *Stromatoceras*. Above *Stromatoceras* just east of the road intersection come thin-bedded ls. with *Hesperothia*. The shaly beds are Benbolt. The *Rosticellula* bed which produced *Oligorhynchia* is at about top Benbolt or basal Wardell.

October 29 -

Breakfast	1.00
Lunch	1.20
Anti freeze	2.65
Lubrication, clean plugs	1.15
gas 10 gal 60065	2.60
Supper	2.25

On Bulls Gap sheet $\frac{1}{4}$ mile NE of St. Clair, fine development of *Chicamanga* here consisting of a thin discordaneous layer of Western lithology. This is followed by blue-weathering limestone containing *Maclurea*. This is the Renoir and it is about 100' thick. It and the contact with the Knox are well exposed in the field and along the old quarry road $\frac{1}{4}$ mile NE of St. Clair.

(28)

Gray calcarenite occurs in
the "uplain". The Effner rock
is in the Athens interval
just on top of the Binnoria
beds.

On top of the Lenoir comes finely
cobbled sandy limestone containing
Chonetina and *Binnoria*, the latter
in abundance. About 400' of this
rock are present. *Binnoria* ranges
throughout. Above this interval
comes a sequence of shale, often
nearly black, and lenses or
fongues of cobbly ls. of up. Lenoir
type and the top one containing
Platystrophia and *Chonetina*.
Below this upper zone and just
on the NW side of Gulley Cemetery
occurs a bed of calcarenite with
Holston type fossils. This is definitely
in the upper Lenoir interval. Thus
the Athens shale and "Lenoir" actually
interfingers.

Along the road leading south
of Tenn 66A and just W of Mills
Pond are Athens shales exposed
for about $\frac{3}{4}$ mile. At the road
intersection just N of Robertson
Creek cobbly ls in yellow shale
contained *Bowerbyella* and a
large *rafinosquinoid*.

In afternoon we discovered
"Whitesburg" trilobites in the field
about $\frac{1}{4}$ mile SSE of White Horn.

In yellow barrier-type shale
at the church in Guthrie Gap.
platy ls. containing cystid stems frequently
yielded *Zygospira* and *Oligorbipha*.
We believe these represent the
Witten horizon. Above this horizon
the yellow shales are overlain
by quartzite and red-beds of the
Bays formation.

(29)

October 30 -

Breakfast
Lunch
Supper
Expenses

1.00
1.00
2.30
0.23.

Spent morning at Edison where we established *Oligorhynchia* in the sequence. Above the top of the Elway below apple tree dark ls. contain *Sowerbyites*. These ls are followed by cobbly beds with *D. atavoides* and the large fauna collected in previous years. *D. atavoides* is followed by dark ls. with *D. willardi*. These limestones are cherty. Above these come fine grained gray ls to gray calcarenites containing *Oligorhynchia*, *Oxoplocia*. The *Oligorhynchia* beds are succeeded by pink or cream coarse grained marble assigned to the Ward Cove. Above this marble comes the Benbolt, 100' or more of cobbly shaly beds. The Wardell succeeds the Benbolt. The Witten is blue gray platy ls abounding in *Syngospira*. The Moccasin forms the top of the sequence.

In afternoon went down to Lee Valley to see beds collected by Ulrich. These proved to be Benbolt-Wardell interval. From Ulrich's description of the locality at the forks of road these fossils may be Wardell. The Camerellas suggest this also. We collected Benbolt N of highway about 0.1-0.2 mile about one mile NE of Lee Valley and Wardell on the highway the same distance from Lee Valley. The Wardell contained *Campylorthis indugestrata*.

(30)

October 31 -

Breakfast

Hotel (3 nights) Morris town

Lunch

Supper

Gas 60156

1.00

13.50

1.25

2.10

1.23

Mosheim type locality - 50' Mosheim overlain by 6' Lenoir rock, followed by 35' of brown weathering granular ls, shaly in places, black to dark gray to light gray in color. This is Whitesburg overlying Lenoir and underlying platy Athens.

Locality 1 mile SW of Albany.

Section like that at Mosheim consists of about 35' of Mosheim resting on the Knox followed by about 30-35' of Lenoir shaly limestone and calcarenite. This is followed by 10-15' of brown-weathering dark limestone assigned to the Whitesburg. In the Fox beds in the road, Whitesburg Trilobites are abundant.

Bluff City - on road crossing Indian Creek at saw-mill are massive calcarenite on W side road at intersection. These contain rhynchonellids and are basal Lenoir. Above these are the characteristic cobbly Lenoir beds which are overlain by shales with *Dicellograptus*. The Lenoir ranges from 40-100' thick.

July 10-18, 1944

Northern Virginia

0603

M. M. Bowman Jr. G. H. 670

Appalachian Valley

July 10, 1944

Left Washington July 9 at
1 P.M. and arrived Charlottesville
4:10 P.M. Stayed at B. N.
Cory's overnight.

Section 4 miles SE of Harrisonburg on
U.S. 33. Total of about 75 feet of
"Mooheim" rock with intercalations
of Lenoir type rock at base.

Then 18' Lenoir lithology overlies
33' of Vaughanite, then 15' of
of Lenoir type.

Covered 210'

Black ls. medium bedded 134'

Then covered with scattered
black sh & black ls. 163'

Lumpy sh with thin ls 38'

Black shale & thin limestones 32'

Sandstone — — — — — 4'

Top of section 247' to bridge

mostly graptolite sh & some ls.

Cryptolithus 150' above siltstone.

Robergia 110' above siltstone.

2 miles S of Hannsburg on
both sides of U.S. 11.

Hannsburg ls. - shaly
limestone base with *P. laticosta*

Nodular ls with

Christiana

25'

Nidulites-bearing ls. with Nidulites 40'

Black shaly limestone of Athens 128'

Coarse x ln ls. suggesting white Seneca 10'

Lenoir

5'

with many bryozoa

Mosheim 161'

down

Section showing open anticline
 $\frac{1}{2}$ mile northwest of Lurville
 Station.

At top are sandy shaly beds
 with *Cryptolithus* and *Calymene*.
 Below this are about 70'
 containing *Renssella* and
Eoplectodonta. This
 bed is somewhat massive
 dark sandy rock. Below this
 is a granular limestone for
 about 35' and below these
 black shaly limestone of
 Athens type. No typical
Chamberlainia here.

Section on M. M. Bowman
 farm, on Co. lay 670. Take
 US 11 for $\frac{1}{2}$ mile, turn east
 of on Co. lay 670 for 1000' \pm . Then
 go N about 300 down ravine
 between house & barn.
Cryptophagus about 60'.
 Below *Glanville* bed with
Christiania and *Renssella*.
 The *Cryptophagus* is about
 25' above the highest
Nidulites. Many fossil workings
 & snails.

0606

July 10

Lunch .40, Supper 1.20, Room

July 11

Breakfast 0.55, Lunch 0.40, Supper 0.90
Room 2 nights 2.00.

July 11

Lantz Mill

Lowest Lenoir with small bowerbyella
suggesting nequius or nana.Cobbly material just above
or on top of Lenoir abounds in
Homotelus, in first ravine to N

Cryptophragmus in This section
occurs with Modulites in cobbly
Chambersburg type limestone. In
the Louisville type of rock at top of
sequence ~~occurs~~ does not contain
Cryptophragmus.

Check horizon of my Lacey
Springs Anapexina. They must
be lower Chambersburg.

Lantz Mill

Whitesburg type section -

Some 20' of Mosheim followed by 30' of Lenoir with large *Opikina* and *Maclureites*. This is overlain by some 45' of yellow-weathering shaly ls. in which we found *Christiana*. Above this are upper Lenoir - type of cobbly beds. Many of the cobbles are granular ls. & have a shaly surface with some fossils. These are the Whitesburg fossils and there are some 10' of this material. It is overlain by platy Athens ls. of smooth dark gray texture and is like the Athens of Virginia.

November 1

Breakfast

Hotel Abingdon, Va.

Supper

Gasoline 60317 Marion

Lunch

1.10

5.27

2.00

2.34

0.90

Visited Lenoir beds at Marion and then went on to Meadow View to see beds at Geisler Mill. 2.1 miles N. of junction with Va 80 from Geisler Mill locality occurs a sequence of Mosheim followed by *Maclureites*. Then another ~~layer~~ a layer of dolomitized *Maclureites* beds. This is followed by more Mosheim-like rock and then comes nodular ls. with *F. inorthii atavoides*? This is followed by Athens.

November 2 -

(32)

Lunch

added to Nov. 1 meal 0.25

Key objects to our correlation of Cudaville with M. Trenton. He says all call it the older Hull. He says sinuities zone is above the Cudaville in base of Hermitage or Bogana not in Cudaville. Now, the sinuities bed directly succeed Christiania bed and include everything from Christiania bed well up into Martinsburg. But Cudaville is basal Martinsburg probably. We have Cudaville on top of Colliertown if he correlates Christiania bed with Shoshone, then Cudaville must underlie the Oranda as it is Kirkefield (Hull).

Visited crinoid locality south of Hansonville but the place is nearly cleaned out. Looked for other places but found only one where we collected *Leophragma*. Afternoon went to Blackford for Benbolt but saw no collecting.

Basal Benbolt is in all probability the very top of the Upper Lefor. This permits us to block in the two zones of *Leophragma*, the Whitesburg one and the Benbolt one.

Rain at night

(33)

November 3 -

Gas 60470

~~Lunch~~

Tip at Lebanon

Room + board (Lebanon) 3 days

Buttz on p. 40 of Bellefonte □
report correlates Rodman with
lower Chambersburg Echino-
sphaerites zone. This is
undoubtedly wrong as the Rodman
contains Orpuda fossils.Shipped 5 kegs from Jazewell.
Visited Perry locality at Witten
Mills and then were rained out

November 4 -

Breakfast

~~Lunch~~~~Supper~~

Gasoline 60625

1.00

2.85

2.32.

Went over to Porterfield Quarry
for morning. Examined "Lenoir".
On the Knox occurs a thin Meigsian
followed by calcarenite of Holston
type and containing snails. Above
this is blue-gray, cobbly limestone
lithologically exactly like the
upper Lenoir. At the bottom it
contains Valcouria and Pileostrophia
mena in great abundance. Then
comes a small Sowerbyella in
abundance. This is followed
by similar rock but with less
fossils brachiopods but containing
large cephalopods. Then comes the
"Holston".

(34)

On way to Pulaski stopped at
 Shavers Fork locality to collect ~~for~~
 silicified fossils. Overlying the
 Athens-like cobbly bed occurs
 calcarenite and cobbly ls. with
Dystactospongia, and *Stromato-*
genium which suggest Wardell.
 Cooper has already called them
 Beubbt. Above these occurs
 Moccasin.

November 5—

Breakfast

1.20

Lunch

1.20

Supper

2.51

Hotel, Pulaski

3.50

Cabin at Christiansburg

3.50

At Quarryville we looked at the
 abandoned quarry near its east
 end. Here the ls. rock under the
 shale is coarse, thin to heavy-
 bedded calcarenite and undoubtedly
 is Holston. Beds of "up. Lenoir" type
 were seen intercalated in the
 lower part of the sequence. Some
 of the quarry beds are a mass of
 small bryozoa. Evidently Butts
 identified Lenoir under the black
 shale at the west end of the quarry.
 The quarry rock at the end we
 investigated is most certainly
 Holston.

Early morning went to Draper,
 Virginia where, on the *Lecanospira*
 zone of the Canadian, occurs a
 chert conglomerate in the base
 of the Middle Ordovician. This
 is followed by about 100' of

(35)

granular limestone containing abundant rhynchonellids. Throughout the entire thickness also present in abundance is *Mimella nucleus*. Above the calcarenite occurs a considerable thickness of cobbly limestone, the upper part of which is cherty. This upper part is strongly suggestive of the Tricolurine but we were unable to find any fossils to prove the point. Cooper claims to have a thin representative of the Whitesburg, then comes the Athens.

Next we visited a large quarry at the Clayton dam, 3 miles E of Radford. Here Mesheim overlies the Knot and is followed by some 200 feet of shaly, cobbly limestone in which *Valtonsea* is common. These beds suggest the "Upper Tenois" but we have no conclusive evidence.

Went to Ellett NE of Christiansburg and saw a sequence of ls. above Mesheim that has Whistle Creek fossils. Last year we thought this to be Tricolurine but the fossils are more suggestive of Whistle Creek. Above these beds occur a few feet of granular limestone assigned to the Whitesburg. Spent two hours collecting in these beds and in the Athens between Ellett and Luster's Gate.

Whistle Creek
V.

Phone to R. S. Edmundson
November 6 -

(36) Breakfast	1.25
Gasoline 60748	1.79
Lunch	1.12
Supper	1.90

Ask Kay for Vermont Christiania
to illustrate in Ms. Look in Cady
for Up. Chazy mentioned in
Kays Pennsylvania paper (p. 12)
Write Svenbøl for Christiania
from Newfoundland.

Christiansburg to Salera, from
Salem over to Catawba and
collected most of morning at
locality at junction of 114 and 311
about 1/2 mile W. of Catawba
Sanatorium. This locality is quite
definitely Whitesburg.

Went east on 114 up Catawba
Valley to Fincastle. Saw 3 localities
one 3 miles east of intersection of
311 & 114 just at base of Mtn. of
Here much shaly ls. of Up.
Seneca type occurs with
many pyrozoa overlying
cherty ls. suggesting Whitte
Creek. Intercalated in this ls.
are layers of Holston-like
material. This intercalation is
best shown on Catawba Creek
7 miles East of the intersection.
Here a great mass of Holston
exists with intercalations of dark
shaly Whitesburg ls. abounding
in *Cyrtomatella*.

Eleven miles east of the
intersection & 1/2 mile W of

(37)

near Haymaker 500' of
marble-like ls. overlies
Lincolnshire and a considerable
thickness of Mosheim. This marble
contains fossils common at
Porterfield quarry and is undoubtedly
the Effna as claimed by BMC.

November 7 -

Breakfast

1.10

Lunch

0.30

Supper

2.00

Room (B&C at Clifton Forge, night)

1.75

Rich Patch -

(on Va 616)

Section 0.6 mile NW of junction 616 and
621 showed a long section beginning
with Whistle Creek at base followed by
Mosheim. Then comes a Lincolnshire
interval in which we found Sowerbyites.
This is followed by beds with *Nidulites*
and then comes somewhat shaly ls.
with *Dinorthis transversa* and *Oxoplia*
in abundance. This is followed by
180' of beds with abundant small
Sowerbyella and, 90' above *D. transversa*,
Cyclospira was found. Above the
Sowerbyella beds come crystalline ls.
with *Oligorhynchia* and *Doleroides*.
Above the crystalline ls. which is
fairly thick comes fine shales.

(on Va 621)

The same sequence appears on
a property 0.6 mile SE of of the
junction of 616 and 621. Here the
shaly beds above *Oligorhynchia*
contain *Tetradium* in layers 25' and
a zone of about 3' thickness about
850' above the base of the shale.

(38)

abounds in *Doleroides*. Above this bed the shale contains few limy lenses and is referred to the Marlburg.

About $\frac{1}{2}$ mile SE on the same road where a large spring comes out of the hill occurs a longer sequence. Here *Nidulites* occurs in the upper beds at the angle of the fence west of the house.

Cooper says upper *Nidulites* comes just under the *Oligorhynchina* bed. In section on Va 616 a *Mosheim* underlies the Whistle Creek beds.

November 8

Breakfast

1.05

Lunch

1.50

Supper

1.90

Varylites S of Burkung
Sp. Ch. - Lincolnshire

Went over to Warm Springs Valley. First section about $\frac{1}{2}$ mile SW of junction of U.S. 220 with Va. 606. Here a thick *Mosheim* is overlain by cherty beds which are followed by dark limestone with *Nidulites*. This is followed by a long sequence having *Sowerbyella* and this by the *Witten*. Above the *Witten* comes shaly beds and thin limestone of the *Moccasin* (or *Eggleson*). The next section occurs $\frac{1}{2}$ mile SW of Sinking Spring Church on U.S. 220. Here an anticline occurs in the *Mosheim*. On the upper part of the *Mosheim* we found *Tetradium cellulorum*. Above the *Mosheim* are cherty beds of possible *Lincolnshire* age but we saw no fossils to prove it. Possibly the *Mosheim* here equals *Lincolnshire*.

(39)

In the upper part of the cherty beds *Nidulites* is abundant. A considerable distance above *Nidulites* black ls. contained *Dunorthis*, *Sowerbyella* and *Nimella* probably the Beulvot. The black ls. extend for considerable distance and terminate with beds containing *Lichtenania*, *T. fibratum*, *Strophomena* and *Bryozoa*. On top of this come characteristic platy Witten beds with *Zygospira*. 100' \pm above the lower Witten comes red Moccasin for considerable distance.

Along the roadside about $\frac{1}{2}$ - $\frac{3}{4}$ mile SW of Sinking Spring Church the cherty beds are well exposed. About 40-50' occur below *Nidulites* and the cherty continues above the *Nidulites* beds. Possibly the *Nidulites* occur in the Lincolnshire. The cherty beds below *Nidulites* are probably Lincolnshire.

In the first section seen SW of the junction of US 220 and 606 the basal beds above the Knox consist of alternating striped blue gray ls and dolomite beds 1-1 $\frac{1}{2}$ ' thick. This is the Blackford and may be the Tiger-striped beds of Kay according to BNE. This interval also contains chert conglomerate.

November 9 -

Breakfast

1.25

Lunch

0.90

Supper

3.15

Hotel (Clifton Forge

3 nights BNC
2 nights DAL

12.50

Gasoline 60 & 30.

1.28

Room Staunton, Va

3.50

Visited Collierstown and went to
locality 2 miles W of Brownsburg
to see Whitesburg.

November 10 -

Breakfast

1.00

Lunch

0.85

Supper

2.75

Car service + gasoline 60967

4.65

" storage

0.50

Rain all day. Called on B. H.
Thompson Bear Springs Glen.

November 11 -

Breakfast

1.40

Lunch

1.20

Supper

3.30

Car storage

0.50

Room Harrisonburg 2 nights

7.00

Morning went to Green Mount
Church about 5 miles NW of
Harrisonburg. Take Va 260 on west
side of Harrisonburg by going
W on U.S. 33 to Va. 260. Green Mount
Church road is indicated by a
sign. At Green Mount Church
The road running west from the

To reach Green Mount take road west from U.S. 11 numbered
721, follow 721 to Edom. In Linville take sharp turn west about 200
yds. E. of store, at Edom turn left on Sta. 260 to 772. Turn
West on 772 to 617. Church was at junction of 772 & 617.

(40)

0702

41

Church shows Trenton opposite the Church. Then Oranda in the field just before reaching the creek. Chambersburg, granular and dark occurs on the east side of the creek. Then comes Athens type of rock west of the bridge.

Of 0.1-0.2 mile north of the Church on Virginia 617 occurs a splendid exposure of Trenton rocks which we identify as Salona on the grounds of finding Salonia. This section extends to the junction with Va. 777 at an old mill. The Salona contained many fossils that occur also in the Oranda ~~Salonia~~ such as Eoplectodonta, Bilobia, Renssella, small Sowbysella, the Salona is quite definitely an extension of the Oranda fauna.

About 100 yards west of the intersection of 617 and 777 occurs a superb section of Oranda all of 30' thick. Here the Oranda is composed of alternating soft and hard layers. At the bottom occur small Renssella, Christania, Hebertella and Bilobia. in the lower 5' Bilobia and small Renssella occur in countless numbers in thin hard limy layers. In the upper 15' Glyptambonites, Renssella and Eoplectodonta are common. The very top bed contains Leptaena in great abundance.

In the Salona Brongniartella occurs about in the middle of the exposed sequence at about the base of the hill. Plectrothis, Parastrophing, Eoplectodonta and the big Rafinesquinae occur above the Brongniartella. Cryptolithus was found throughout the Oranda and in throughout the Salona.

Look for Glauconia in
Chambersburg collection.

42

November 12 -

Phone to reserve room in Winchester	0.45
Breakfast -	1.35
Lunch -	0.85
Supper -	2.55
Lodging Woodstock	3.00
Green Mount Church at junction	
772 + 617.	

Cryptophagnus at Bowman Farm are in black somewhat shaly fracturing limestone somewhat of Athens type.

Spent morning collecting at Green Mount Church. Fossils taken from Salona are from about 35' of beds.

Went to Lacey Springs where we found Chirotrania with Rotergia and Ansyxina. Through about 150 - 200' of rock, hitherto called Athens

November 13 -

Breakfast	0.90
Lunch	1.00
Supper	2.05
Lodging Winchester 2 nights	6.00
Gasoline 61090	1.70

Morning visited locality along Swover Creek 0.6 mi. S of junction of 691 + 692, W of Lantz Mill. Oligorhynchia is very abundant in the lower part of the St. Luke formation. It occurs just over the fence which is approximately on the boundary between the St. Luke and underlying Edinburgh formation.

43

Fossils are very scarce in the upper beds of the St. Luke. At this locality occurs an excellent section of Orinda and Martinsburg.

Next I went to Strasburg Junction to see section. The fossiliferous beds collected by Butts and the Cybelopsis bed are definitely under the granular beds we assign to the Whitesburg. The Cyrtosotella beds, we now believe, belong to the Athens as revealed at Sharon Springs and the Porterfield Quarry. This is the Athens that goes over into Ward Cove & Benbolt.

Went to Hypp Hill to collect dirt and etching material. This is a superb section for Nidulites which occurs from the highway almost to the very top of the Chambersburg. Benbolt elements seen in the lower part of the Nidulites zone are Platycystites and Dinorthis transversa. The latter occurs in the field where the innumerable etch pieces were collected. With it occurs Corinorthis and Christiaqua. Beds at the top of the Chambersburg section contain numerous Cameroladia.

44 November 14-

Breakfast
Lunch
Supper1.20
1.20
2.95

Rain all day but visited Rest where dark intercalations occur in the Mosheim. We found large ostracods and *Strophomena* in the dark granular rock. This suggests that "Lenoir" type rock interfingers with the Mosheim. We also saw several fossils suggestive of *G. cellulosa* but were unable to collect them because they were on large slabs.

Went to locality 1.7 miles SW of Wadesville. To locate Whitesburg said to be in that section. Between "Lenoir" and Chambersburg type of rock occurs a considerable thickness of shaly and platy ls which include occasional thin granular plates or lenses. These granular masses contain fossils such as *Conicorthis*, *Pessicella*, and *Christiana*. These indicate a relationship with post-Whitesburg Athens. No true Whitesburg was seen.

At Strasburg junction about 15' of granular and shaly limestone lies between the granular beds and the cherty *Finschschists*. These beds contain abundant *Strophomena* at base, *Trilobites* and at top Whitesburg-type fossils appear. It all may be Whitesburg.

45. November 15-

Breakfast

1.35

Lunch

1.85

Gasoline (61261)

2.22

Binnoria at road crossing of Blk 50
over Opegnon Creek, Echinops
also

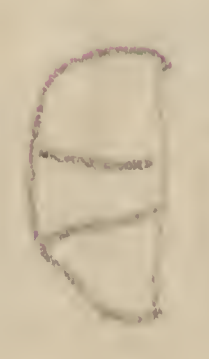
Mileage on return to Porter St.

61336 To Capitol Garage 61342

On east side of Winchester saw
black ls. beds in Mosheim all
underlying beds with Oxoplectra.

[Faint, illegible handwriting]

[Faint, illegible handwriting]



0704

1945

August 30

All Whistle Creek specimens should be ~~relabelled~~ relabelled to read 2 miles NW of Lexington.

Saw a long section along Collier creek on road beside Creek 1/2 mile NW of junction of 251 and — at pipe line crossing of road. Here we saw "Lenoir" with Whistle Creek fauna overlying the Mosheim. This is 187 feet thick and is followed by coarsely granular Murat about 5' feet thick then 40' dark bedst. 12 more ft. Murat.

Above the Murat is "Lenoir" containing Sowerbyites. Dark granular limestone. 185' thick. Coop got *D. atavoides* here also.

75 B Botetourt ls. not well developed or exposed but about 8' \pm Metabentonite 50' above Botetourt This is followed by intercalations of slabby Athens ls and cobbly Chambersburg type ls. 3 cobbly intercalations but only one good body of Athens type 400'. This unit abounds in

Homotelus, Amicyrus and other
Tubobites, mostly broken but
with very little else.

Then follows 15' of Athens
lithology with Dimorphia
transversa, and above this
D. transversa occurs through
60' of cobbly beds. These also
contain Oxoplicia, Christiania
Huselunk is the brachiopod
zone of the Strasburg section.
Above this is cobbly limestone
ca 200' thick. No Medulites
occurs.

Above this are 20' of dark
granular ledge-making ls.
Then 25' of striped "others"
Above the Athens are 60'-70'
of gray argillaceous ls limestone
with calcarenite lenses
containing Rafinesquina,
Lambephyllum.

In afternoon visited
Whistle Creek Area. About
1/2 mile down the creek
and 70' below the Botetourt
occurs D. atavoides just over
the Murat. Thus the Lincolnshire
here is divided into two
members by the Murat. The
~~Basal~~ Whistle Creek below
and D. atavoides beds above.

White Lany Whistert
for Salama
material

Echinospira

August 31

Section about 4 miles
N of Rockbridge - Augusta
line on Va 662
1 mile S of McKinley
= Rb 17 - on Walker Creek
2 collections

15'

Botetourt

131'

lowbyites & } cherty ls.
D. atavoides

Lincolnton

5'

I. syringosoides bearing vanhantae 5-Dale

229'

cherty ls. with big Lepteditia in lower
part, Multicostella, Strophomena &
Dinorthis holdeni.

Blocky chert zone
= Elroy

15'

Impure calcilutite

70'

Impure striped ls., gastropods

Blackford

Knox

0707

1/4 mi. E intersection 608 +
652, spring crosses road
ca 6 mi SE of Stanton Va.

Send Coop Warburg's paper

July 5. July 15 - Sept 8, 1946

Charge for \$450 Travelers checks

~~3.38~~

July 13 With P.E. Cloud
✓ gals gasoline Washington

1.60

July 15 Started 7:10. Mileage 55697

Caster OK both wheels

Camber $\frac{3}{4}$ in left, $1\frac{1}{2}$ in right wheel, should be $\frac{1}{2}$ in both.

✓ Gas 10 gals. Harrisonburg, Va (55832) 2.40

0.55

Lunch

0.75

1.30

9 gals, 3 qts Pulaski (No Receipt) 2.33

Supper Pulaski

0.75

Room Abingdon

2.50

July 16 Abingdon 58086

Breakfast

0.60

0.60

0.50

0.80

1.90

Gas 11.3 gals. Rutledge, Tenn (56193) 2.88

Lunch

0.50

9.4 Mc Minnville

2.35

July 17 { 10.8 Linden, Tenn. (56537) 2.75
Toll over Perryville bridge (56550.4 at End) 0.55

Supper

0.80

Room Linden, Tenn.

1.50

July 17 Breakfast

0.75

Lunch

0.50

Gas & Oil Brownsdale

1.96

Supper, Wynne, Ark.

0.71

Night lodging, Wynne, Ark.

1.50

0.75

0.50

0.71

1.96

Morning went down to Blue Mound Glade and collected until 10:30. Went through Memphis headed for Batesville but met construction and were forced to stay at Wynne.

(2)

July 18 Breakfast (53797) Wynne 0.56
 10.8 gals. gas 2.58
 Lunch 0.72
 Grease job, Batesville 1.25
 Supper 0.67

53
 72
 1.67
 1.95

July 19 Breakfast 0.30

To go to Searcy Spring Lake
 Ark. 11 ^{4.8} miles from
 intersection on N. edge of
 Batesville to Baptist Church
 then turn on side road.
 Supper 0.72

July 20 Breakfast 0.67
 Gas 7.1 gals. Batesville 1.70
 Good exposure of Ruddell on
 NW side intersection at Oneal
 about 12 miles W. of Batesville
 Lunch 0.57
 Supper 0.82

0.67
 5
 1.82
 2.49

Afternoon collected under trestle
 over Arkansas 106. Here along ark 106
 to east a nearly complete section
 of Moorefield is exposed. Shaly ls.
 Overlies Boone but above this is
 fossiliferous Boone-like chert up to
 bend in road near top of hill. Just
 below top of hill. *Leydinella* is
 abundant. Hill is held up by a
 thick sandy ls. with *Lingula* which
 is the very top of the Moorefield.
 The Ruddell lies on top of this bed

(3)

July 21. Breakfast

0.56

Lunch

0.52

Gas Smithville, Ark. 9 gals.

2.07

Supper

0.68

Mileage Batesville Sunday night

57130.

Room Batesville 4 nights

6.00

On morning went to
 Moonfield to see shale. Then
 went on to Black Rock, Amboden
 and Smithville to see Lower
 Ordovician.

July 22 Breakfast

0.61

Gas, Oil Conway, Ark

2.85

Lunch Clarksville, Ark

0.61

Gas Webbers Falls, Okla

2.20

Room 3 nights Muskogee

6.00

Supper

\$4.45

Left Batesville 6:30 A.M. arrived
 Muskogee about 4:15 P.M.

July 23. Breakfast

0.61

Lunch

0.56

Supper

1.52

Collected Mayes east of Fort
 Gibson all day.

2.69

July 24 Breakfast

0.31

Supper

0.07

Collected south of Glendale
 school all day.

(4)

July 25 Breakfast ~~0.41~~
 Gas Muskogee ~~2.08~~
 Lunch, Prague, Okla ~~0.90~~
 Gas Norman, Okla ~~2.22~~
 Promised to send Decker
 exchange This fall.
 Supper Sulphur, Okla ~~1.07~~

July 26 Room, Sulphur, Okla ~~2.55~~
 Breakfast ~~0.51~~
 Lunch ~~0.50~~
 Gas, Gainesville, Texas ~~2.12~~
 Supper, Fort Worth. ~~1.75~~
 Collected White Mound, Rock
 Crossing. Called on Kenfros in evening.

July 27 Breakfast ~~0.95~~
 Room Fort Worth ~~2.20~~
 Car storage ~~0.50~~
 Gas Temple, Texas ~~2.66~~
 Lunch ~~0.50~~
 Grease, change oil, Austin ~~2.50~~
 Supper at Barnes.

July 28 Breakfast ~~0.60~~
 Room Austin ~~2.10~~
 Gas Fredericksburg ~~2.12~~
 Lunch ~~0.95~~
 Gas, Ozona ~~2.25~~
 Room, Fort Stockton ~~3.00~~
 Supper ~~1.10~~

(5)

July 29. Breakfast
 Hammer handle
 Water bag
 Lunch
 Supper

~~0.55~~
~~0.25~~
~~1.00~~
~~0.69~~
~~0.70~~

55
 69
 70
 194

July 30 Breakfast
 Lunch
 Gas
 Supper

~~0.55~~
~~0.55~~
~~2.64~~
~~1.00~~

Collected all day at 706 + 706e
 Hammer handle, chisel

~~2.45~~

July 31 Breakfast
 Lunch
 Supper

0.45
 0.55
 1.00

Collected all day at 702 c.

Aug. 1 Breakfast
 Lunch

~~0.60~~
~~0.30~~

Spring bed is 490 paces SW of
 bend at top of hill opposite
 storage cavern on hill to S.
 From a point 490 paces SW it is
 123 paces NW of road (at right
 angle to road).

Supper
 Gas + oil

~~0.95~~
~~2.30~~

703 d - In platy limestone some 15-
 20' above Aulosteges bed inside
 bend of road at head of canyon
 on way to Split Tank.

0713

(6)

Aug 2 Breakfast

~~0.80~~80
80
100Dolomite just above granite
bus is $\frac{1}{2}$ mile by road \pm
of gate at large tanks

Lunch

~~0.80~~

Repair fire

~~0.75~~

Gas Alpine 8.7 gal

2.15

Sacks for packing

~~0.85~~

Lumber & hammer handles

4.29

Wedges for handles

0.10

Supper

~~1.00~~

Aug 3.

Breakfast

0.70

Lunch

0.46

Supper

1.00

Laundry

1.00

326 Box 1. - 706e-1; 703d-1; 706-2;
703c-2.

387 Box 2 - 706e-3; 702-1; 703c-2.

Aug 4 Breakfast

~~0.45~~

Lunch

~~0.85~~

Supper

~~1.35~~

2.65

303- Box 3- 706e-2; 702-1; 703c-1.

280-Box 4- 706-3

365-Box 5- 702c-1; 706e-1; 707a-1

315-Box 6- 702c-3

319-Box 7- 706e-1; 702c-1; 703d-1;
703c-1; 702-1.

7. 4
 192
 254
 274
 280
 290
 323
 310
 319
 315
 365
 280
 303
 387
 326

4218
 240
 369
 249
 205
 3

5281
 46
5327

3798

18
 30
540

5281
 540
4741

⑦

- 310-Box 8 - 702C - 3; 703d - 1.
 323-Box 9 - 702C - 3; 703C - 1; 702 - 1.
 290-Box 10 - 703C - 3; 702 - 1.
 280-Box 11 - 702C - 2; 703C - 1; 702 - 1.
 274-Box 12 - 702C - 1; 702 - 1; 703C - 1;
 706 - 1.
 254-Box 13 - 702C - 2; 703d - 2.
 192-Box 14 - Miscellaneous + Decil
 Scacchinella bed.

L. O. Kennedy - Marathon, Box 144
 Send card of Museum.
 Score -

706e -	1, 3, 2, 1, 1,	8
703d -	1, 1, 1, 2.	5
706 -	2, 3, 1,	6
703C -	2, 2, 1, 1, 3, 1, 1,	11
702 -	1, 1, 1, 1, 1, 1, 1,	7
702C -	1, 3, 1, 1, 3, 3, 2, 1, 2,	16
702e -	several small blocks	3
706C -	2, 1,	3
706d -	small	1
706b -	1	1
701d -	2, 2	4
701g -	1	1
701e -	1	1
707a -	1	1
707h -	1	1
		<hr/> 69

Aug 5 Breakfast

0.45

Lunch

0.65

~~Supper~~

1.00

Cart boxes to station. Collected
at elbow of Hess Canyon in
afternoon

Aug. 6. Breakfast

0.45

Lunch

0.45

~~Supper~~

1.00

Gas

1.74

240 Box 15 - 706 c - 2; 706d several
small

702c - Point of hill, 1.15 miles
S21°E of divide on road to Old
word Ranch, point of hill and
south of Mtn front for 1/4 mile.
Mostly beds with *Rhipidomella*
Hess fossil bed of King. It is
also 1.35 miles S50W 10 of
Leonard Knob 702c.

Rain in morning. We packed
and set up the remaining
boxes.

Aug 7 Breakfast

0.45

Lunch

0.41

~~Supper~~

1.00

Collected on Wolfcamp Hills
all day. Mined on way in and out

(9)

701g - Orthotichia bed at head of branch of canyon flowing north into main canyon. This material is considerably under the beds forming the dip slope of west side of this tributary canyon.

Aug 8 Breakfast
Lunch
Supper

0.45
0.69
1.00
2.14

369 Box 16 - 706b - 1; 701d - 2; 701g - 1; 702d many; 702e many

249 Box 17 - 706c - 1; 701g - 2;
701c - 1.

Collected 702d in morning; packed two remaining boxes in afternoon.

Aug. 9. Breakfast
Lunch
Supper
Laundry

No receipt

0.45
0.50
0.85
1.25

205 Box 18 - 707a - 1; 707b - 1; 707a - many small.

46 Box 19 - tools

Service car
Haul boxes to station
11 night's marathon

3.45
1.28
20.00

(10)
Aug 10.

Breakfast

Lunch

Supper

Gas Decos

Speedometer at Marathon 59072

Gas Artesia, N. Mex.

Arrived Alamogordo, 6 P.M.

~~0.40~~~~1.25~~~~0.85~~~~2.50~~

1.92

Aug. 11.

Breakfast, Lunch

2 nights, Alamogordo

1.33

4.08

Went to canyon due east of N. Mex. school for blind, about $3\frac{1}{2}$ miles east of N edge of city.

Walked up canyon about $\frac{3}{4}$ mile. Sly Gap exposed as yellow, silty ls breaking down into cobbles.

Dark silty shale beds present. Overlying Sly Gap comes Caballero fm. equivalent of The Chouteau.

This is cobbly gray + blue gray ls. containing fresh fossils.

Aug 12.

Breakfast

Gas oil

Gas Denning

Lunch

Supper

~~0.51~~~~2.69~~~~1.72~~~~0.95~~~~1.17~~

Collected Percha at Georgetown N. Mex. all afternoon. To get to this place go to Santa Rita. Take left fork going NE at east edge of Santa Rita for seven miles. Locality is just N of the hair pin loop at Georgetown in Silver City \square .

⑪

Aug 13. Breakfast 0.95
 Lodging, Silver City 1.78
 Gas, oil Bayard 2.50
 Lunch 0.56
 Supper 1.00
 Lodging, Springerille, Ariz. 1.50
 Gas Lynn. N. Mex 3.00

~~Aug 14~~. Collected in morning at a fine
 Percha locality exactly 4 miles ^{E. N. E.} east
 of east edge of Santa Rita, about
 center of 175 + 11 W at very edge of
 Silver City □. The locality is $\frac{1}{8}$ - $\frac{1}{4}$ mi
 north of the highway.

Aug 14 Breakfast 0.56
 Gas 2.70
 Lunch 0.61
 Groceries 1.00
 Lodging Grand Canyon 1.40
 Supper 1.25

Aug 15 Breakfast 0.71
 Gas, Grand Canyon 3.30
 Lodging, Jacob Lake 2.78
 Supper Jacob Lake, Ariz. 1.16
 Standed Jacob Lake with bad fuel pump.

Aug 16- Breakfast 1.01
 Gas + oil 3.22
 Supper, Cedar City, Utah 0.70
 Service car, change oil Cedar City 5.49
 Lodging, Cedar City 2.00

Aug 17 Breakfast 0.50
 Gas, Pioche, Nev. 1.80
 Lunch, Ely, Nev. 0.80
 Supper 3.00
 Galt. Eureka, Nev.
 Arrived Eureka 3 PM

(14)

Look up collections of Little Oak
and Odenville collected by Cloud
and Bridges in 1943.

Aug 18 Devils Gate. barbecue in evening
at Mitchell at Ruby Hill.

0.45
0.55

Aug 19. Breakfast

Windfall Canyon

335'

226'

115'

Ca 500'

78'

120'

Gray granular cherty ls. in beds up to 1'
separated by thinner ls. beds fossil none

Mostly covered but evidently platy & bedded
to up to 4", gray in color. Looks E

Massive bedded light gray ls, blocky fracture

yellow weathering, thin platy ls, gray blocky in
fresh fracture, of ten light red on plates

78' similar to below but more compact, and
zone I - Dark blue platy ls. weathering
reddish, yellowish & brown but with
patches of blue

Dunderberg

Hamberg dol.

Nemertis was seen on nose
of hill over road about 50'-100'
above Elkaria Thick bed.

10'-12' massive layer at base

Aug 20 Up hill 55° E from Cor 3-195
 Finnie. This corner is in ravine $N10^{\circ}$ W
 from water tower at Ruby hill and due
 5 of peak at head of draw. Rock from
 pit at corner is ribbon banded, thin-
 bedded platy ls, dark gray when fresh
 but weathering yellow.
 At about 102' above pit comes ledge
 of dark gray thin-bedded cherty ls.
 welded into massive ledge. Hackly
 fracture
 102' - 113' - same, black chert.
 113' - 150' - covered
 150' - 177' Gray ls. weathering drab
 gray, thin-bedded with layers of
 dark gray chert about 1-4" thick. Trilobite fragments
 on loose plates. $N32^{\circ}E 30^{\circ}S$. More
 massive at top and thicker bedded.
 177' - 195' - covered
 195' - 206' - Ledge of light gray
 hackly fracturing ls., thick bedded.
 suggesting base of zone 3.
 206' - 233' - top of hill in same ls.
 Long dip slope on SE side
 Prospect quartzite on hill opposite
 whole slope to crest

(14)

Aug. 21

2nd block to N

Windfall (Ridge SE of Hamburg Mine)

Zone 1. Weathered surfaces predominantly blue with pink & purple patches. Platy, conchoidally fracturing when plates are separated. Fresh fracture finely hackly, dark gray. Contains massive beds, very finely granular, almost smooth in fracture. Contains some banded dark gray - black chert that weathers dark or light yellow brown. Banded layers often welded into masses but fracture platy. Layering very irregular & layers separated by irregular silicious layers.

Zone 2 - Platy, predominantly yellow - weathering, light yellow to light gray in fracture, usually finely to moderately coarsely granular. Some plates fracture mouse gray, usually sparkling from calcite grains.

Zone 3 -

1 - 85' heavy-bedded ls., dark gray fine-grained hackly fracture. Layers from 1-3" up to 2-3'. Chert uncommon scattered and bedded. Sections of fossils numerous. Elkanina in lower part. Bedding wavy when seen on surface.

2 - 30' - Thin-bedded ls., yellowish surface, irregular bedding. Many Trilobite fragments. Layers up to 4" thick.

3 - 10' - Dark-weathering gray, heavy bedded ls. Mostly chert free where seen.

4 - 25' - Thin & thick bedded ls. with "oolites" at top. Section ends on long covered slope.

(15)

On east slope of N end of ridge
SE of Hamburg mine. Nautilus,
Leiostridium and associates occur 75'-
100' above the massive ledge at
base of zone 3. Schizambon occurs
in platy ls about 15' above the
Leiostridium and is thus definitely Ord.
Schizambon occurs in beds with
Leiostridium.

Aug 22 Gas Eureka, Nev. 3.00

Aug 24 Lodging 1 wk. 20.00

Aug 29 Laundry 2.00

Aug 31 Nails & glue 0.35

Newspaper for wrapping fossils 0.20

Rope 0.50

Ware 0.20

Sept. 2 Collected up Copenhagen on north
slope of hill 8.16.7 in Martins Ridge
Lower beds in black shale containing
Brimmia, Leptellina, Reuschella. Higher
beds contain impure limestone with
Spirifer in lower part, followed by
Oxoplectra, Balobia. Above this beds
are very impure, mostly a ss.,
lumpy and like the Orinda. This
contains Reuschella, Sowerbyella and
a few other brachs. Just above
Reuschella comes Cryptolithus.

Sept. 3 Dinner 1.20

0723

Sept 5 19 days board

33.25

Sept. 6 Mileage on departure from Eureka

61629

Lunch

0.25

Mileage in Salt Lake City

61980

Aug 7 Breakfast 88

0.90

Lunch

0.40

6292

Aug 8 Fare to airport

0.75

Porter Chicago

0.50

① Trips Central Texas
February 1946

- Feb. 1. Purchase \$1.40 in Travelers Cheques 1.05
- Feb. 7. Left Washington on National Limited
at about 6:45.
Taxi to station 0.30
- Feb. 8 Breakfast 1.15
Lunch 1.10
Supper 1.70
395
- Feb. 9. Below Paley line going coming
down in torrents. All this part
of Texas a quagmire
Breakfast 1.15
Lunch 1.40
Baggage 0.40
- Feb. 10. Arrived Austin on train 4:05
Met by Preston & Barnes, went
to Bureau for two hours then to
the Cloughs for the night.
- Feb. 10. Spent day at Austin, morning at
Bureau, afternoon in Memorial
Museum. Evening had dinner with
a large group from Texas U.
Dinner 1.50
- Feb. 11. Left Austin about 8:30 AM. went
to Honeycut bend on Pedernales R.
E of Johnson City. Collected there
in morning from lower heavy ledge
of Pennsylvanian which rests on
the dolos and underlies the
Marble Falls spinulite.
Afternoon collected same horizon
near Honeycut Spring. Here
found large spinifer, productids and
Bromeria 1.70

Owe P.E.C. 1.75 Room in House
1.70 lunch material

P E C owes me 1.25

\$ 2.20

②

and *Brytonia*, the latter suggesting the ones from the Barnett shale.

Went to Marble Falls ~~and~~ and examined the sequence on the south side of the gorge of the Colorado R. Found few fossils.

Feb. 12	Lodging Feb. 11 -	-	1.50
	Supper " "	-	0.80
	Breakfast " 12.	-	0.60
	Supper " 12 -	-	0.85

Collected Smithwick shale at Bend, then collected zones of Barnett shale $2\frac{1}{2}$ miles SSE of San Saba. *Rondatites* common in thin beds throughout section. Small *Triopodites* & *Favosites* common in top 2'.

Lodging, Llano	1.75
----------------	------

Feb. 13	Breakfast	0.75
	Lunch San Saba	0.45
	Supper	1.00

Bought 10 lbs. pecans	2.50
-----------------------	------

Left Llano for San Saba. Collected Barnett on road north of Llano. Collected Marble Falls on Texas 16 about $2\frac{1}{2}$ miles S of San Saba. A shale with *Chonetes* is underlain by a limestone containing *Spirifer* and *Derbyia*. The two collections are to be kept separate.

Lunched at San Saba.
Went to morning collecting.

③

place on big Sloan Ranch and
visited Kupfers "boat tank" on
same ranch NW of river crossing
(Maxwells crossing). First place
the Merrow is bituminous ls.
with many Marginifera.
Night at Brady

Feb. 14

Breakfast

0.75

Lunch

0.60

Supper Brady

1.00

Lodging 2 nights (Brady)

4.00

Morning went north of
Brady to collect Pennsylvanian
fossils at Tife. Afternoon
collected Chaptal & Hamburg
from sinks on San Sala River

Feb. 15

Breakfast

0.55

Lunch

0.65

Supper

1.00

Collected all day at TF 406
locality

Feb. 16

Breakfast

0.70

Kegs (16)

1.20

Supper

0.50

Collected all day on Barnett
limestone on large area in
Bear Spring area. TF 422
of Cloud.

- ④ Feb. 17-
 Feb. 17 Breakfast 0.35
 Lunch 0.70
 Supper 0.95
 Collected at White Crossing 10 mi
 SW. of Mason, Texas.
- Feb. 18 Breakfast 0.75
 Supper 0.55
 Spent all day at Barton Ranch sec
 1, ~~3200'~~ 3200' S 1/4 of White Crossing
- Feb. 19. Breakfast 0.55
 Lunch 0.36
 Supper
 Hotel (Mason 4 nights) 9.50
 Barton Ranch sec. No. 2. in morning
 Here *Leirlynchus* occurs low in the
 Burlington sequence.
 Afternoon went up Honey Creek
 about 1/2 mile above rock cabin
 to collect Chappell. Returned to
 Mason about 4:15. Left for
 Austin about 4:50.
- Feb. 20. Lunch 0.40
 10 kegs 95
 Bags to head kegs 0.75
 0.50
 Spent most of day packing &
 shipping 16 bags.
- Feb. 21. Lunch 0.90
 Supper 1.05
 Fare to Washington 73.51
 5 nights in Austin 10.00
 Spent day about Austin in collection

5

Kegs

No label ~~TF~~ TF 422 Barnett, E side Bear Sp. and
~~✓~~ " " " " " " " "
~~✓~~ Whites Crossing
~~✓~~ " "
~~✓~~ 3-3200' S 140° W of Whites Crossing
 ✓ { ~~✓~~ Pennsylvanian +
~~✓~~ "
~~✓~~ 8-
~~✓~~ 9-
~~✓~~ 10-
~~✓~~ 11-
~~✓~~ TF 406
~~✓~~ 13 TF 406
~~✓~~ 14 TF 406
~~✓~~ 15 TF 406, 417
~~✓~~ 16 Misc. Barton Ranch sec 2

Feb. 22 - Left Aust in on 10:10 Train
 or Lusitania Special.
 Lunch
 Supper

1.15
 1.70

Feb. 23 Breakfast
 Lunch
 Supper

1.12
 1.60
 1.75

4.47

Feb. 24 Breakfast
 Taxi to home

1.00
 0.40

1947

October 26 - Left Washington 8:50 on
Tennessean and arrived Knoxville at
9:45 Central time. Met Al.

Taxi	0.95
Lunch	1.80
Supper	2.00
Tip to porter	0.25

Oct. 27 -

Breakfast	0.46
Supper	1.12
Room 3 nights	10.50
Friendsville	

Oct. 28

Breakfast	0.56
Lunch	1.05
Supper	1.63

Visited Friendsville with Phil King,
J. Bridge, J. Dunlap. Granular
beds behind Quaker Church are
assigned to Mosheim by Dunlap. A
swale in Knox is filled with
bottom sweepings and overlain by
Mosheim. Dunlap favored the idea
that the calcarenites are really
Mosheim. Dunlap took us to a place
1 1/2 miles N of Friendsville on
East edge of Concord sheet. Here
Knox is overlain by Mosheim lithology
and Lenoir lithology within short
distances. In other words Lenoir
and Mosheim occur together. The
evidence is clear that Mosheim
is Lenoir.

②

Oct. 29-

Breakfast

Supper

0.61

1.27

Spent day trying to locate fauna in Sevier in vicinity of Friendsville. Gosseneck fauna not same as Miser according to Al. A mile from Big Spring we collected brachiopods in high Sevier. That suggested Beurbelt. In afternoon debated roads at Meadow, Rega and McMullen.

Oct. 30.

Breakfast

Lunch

Supper

0.66

0.78

1.48

2.82

Morning visited Lenoir at Lenoir City and Philadelphia and went on to Christiansburg. Afternoon Al and I ran roads south of Athens. Found a Sowerbyites zone in a sort of Biohermal mass about $1\frac{1}{2}$ miles south-southeast of Athens. Irregularly bedded lime stone, very impure in yellow - weathering blue. Contained *Multicostella*, *Cyrtotrochella*, *Dinorthis* and *Sowerbyites*. The latter is small and very fine-lined.

Nearly 3 miles south of Athens found nodules in yellow shale containing *Dinorthis* like *willardi* and *Oligorhynchias*. These two localities are extremely suggestive of Hogskin but some of the species and assemblage are not quite like the Hogskin.

(3)

0731

Oct. 31 -

Breakfast

0.77

Lunch

0.45

Supper

1.78

Travelling

3.50

Visited Heiskell and saw sections around Fleanor Mill.

Nov. 1. -

Breakfast

0.82

Supper

1.60

Call Phil King twice

0.60

Visited Hogshin Valley and Evans Ferry. Moore's students found *Oligohyrachia* just under or over *Sowerbyella* bed opposite big white house in Evans Ferry section. I failed to find any but did see abundance of *Alectocamans* at the same horizon. This puts these two genera as high as Wardell.

At Rose Hill Charley Wilson thought the beds between Curdsville and the thick Bentonite is upper "upper" Carter. The Witten and Moccasin are undoubtedly related to Lebanon and Carter. Moccasin may = Lebanon.

We saw *Hydrulites* in the Rose Hill section. Tenn.

Beds on Tenn 33 about 1.7 miles NNE of Holls X roads are in the "Hogshin".

④

November 2-

Breakfast

1.00

Lunch

1.05

Supper

1.53

Visited Hagan section, Wilson. Thought upper Merossian with fossils is Carters, and Eggleston between. The Bentonites is upper Carters. Top of Eggleston is about 5' above top Benton. Most of our collections are from below lowest Rickle Bentonite.

Call to Phil King

0.50

November 3-

Breakfast

0.77

Call Byron Cooper

0.55

Supper

1.73

Sent off boxes, went to Morristown and Bull Gap. Oligorhynchia beds in Gullie Gap occur on east side road as far south in gap as second house from church in gap.

November 4

Breakfast

0.61

Lunch

0.61

Supper

1.53

Visited Red Hill. Lower Byfield beds lowest part of Hogskin, followed by Drinth in abundance which extends to about middle of formation. Oligorhynchia in upper half.

Afternoon went to Lee Valley

⑤

for O. Hesse. Lower Benbolt
contains *Paleostrophomena* and
Bygonia. Best locality about 1.4
miles NE of Lee Valley and 0.1-0.2
miles north of road.

Nov. 5

Breakfast

0.72

Lunch

0.56

Supper

1.53

Tip

0.25

Room Morristown, 2 nights

4.50

Rye Cove and vicinity.

Nov 6. Visited Hansonville and
BN Cooper.

Hotel Abingdon

2.50

Breakfast

1.15

Lunch

1.06

Tip

0.25

Nov. 7

Breakfast

0.85

Lunch

0.90

Supper

1.60

Hotel Blacksburg

2.50

Went from Blacksburg to
Harrisonburg. Visited Duhon and
Church & Section SE of
Harrisonburg.

0734

Nov. 8

Cabin Harrisonburg

2.00

Breakfast

0.85

Lunch

0.75

Supper

0.80

Sections from Harrisonburg
to Strasburg. Arrived Washington
9:00 P.M.

0735

1948

October

79423

Grease job. 79612.

Oct. 9.

Left Washington 7:30 AM.

Mileage 79423

Lunch Lexington

Wrecking bar

Gas, oil, grease job, Lexington

Gas Wytheville, Va

Supper

Room, Abingdon, Va

Oct. 10.

Breakfast

Intercession 3.55 - 2.65 = 0.9 mile

to Lowerbyites bed south of Athens

93.55

Gasoline (Knoxville, Tenn.)

Lunch (Lenoir City)

Tip

Supper

Room, Athens, Tenn.

Oct. 11.

Saw good Lenoir ss between Lenoir City + Philadelphia, on both sides US 11

On Knox about $\frac{3}{4}$ mi SE Britton Cr.
 Calhoun □ are some 5-10' of red & green
 shales, then about 250' covered on road
 to lower Athens shale with Riverdale
 fossils

Breakfast

Lunch

Supper

Alhambra Court 3 nights

Repair carburetor

Gas Sweetwater

Early in morning visited section
 on Hiwassee River SE of
 Charles Town, Christiana beds
 culminating in peculiar oolites
 suggest assignment to the

(1)

✓0.65

✓0.65

✓6.99

-2.10

1.65

3.00

✓0.75

✓3.03

✓0.68

✓0.70

✓1.68

✓2.50

✓0.75

✓0.41

✓1.50

✓6.75

✓2.45

✓2.15

75
 168
 68
 311

1.16
 1.50
 266

Whiteburg. At locality about 5 miles NE of Charleston (3/4 miles SE of Britton Church). The Knot is 300' east of road intersection. It is followed by 5' of variegated red & green sh (red at base, green at top). Then 250' are covered when the brown sandy shale of the Beeville beds appears. Above these are black platy limestone of the Athens. The sequence is thus very much like that at Charleston as regards the Christiania beds.

It is interesting to note that Keith on the Ludden Sheet pushes the Athens out between the south west edge of the map and Christiansburg. The passage to limestone is not complete here but does become complete at Friendsville.

At the Britton Church place, as at Charleston, the Christiania beds could be set out as a member.

Oct. 12

(3)

Breakfast

0.51

Lunch

0.77

Supper

2.07

Morning collected at Negro Cemetery on east side of Friendsville. Went to Friends Church. Opposite church in ditch are red & green shaly rocks, similar to those seen SE of Button Church locality. Possibly it is rotten dolomite, possibly Bladeford. It is not exposed behind the church.

In the section 1 mile NE of Friendsville about 10' above the Valcouria granular ls. occur large sp. brachyites - like brachiopods suggesting the Plectambonites amples of Raymond seen abundantly at Christiansburg. No Christiania occur with them and I assume them to be a different species.

In the section on the south side of the road the Billingsea beds are beautifully displayed. They appear just above the granular Valcouria beds at the edge of the woods on the beginning of the east slope of the first hill which is composed of the Mosheim. Billingsea occurs commonly on east slope of second hill just west of stream & house. The west slope and top of the hill just east of the first house are composed of blue-gray shaly ls. On the east slope of this hill the Christiania come in by the thousand but no perceptible lithological change occurs.

0738

(4)

Oct. 13

Breakfast

0.72

Lunch

0.46

Supper

2.03

321

Check Stroph. mesleri for
a specimen from Hogskin from
Fleming Hill. This is not
Hogskin but *S. tennesseensis*
from road brought into field

Repair rear tire

2.75

Gas Knoxville

2.32

Oct. 14

Breakfast

1.00

Lunch

0.46

Supper

2.03

Room (one night) Knoxville

2.25

Phone Call to Blacksburg

1.00

No Hogskin east of Mt. Eager
Church over to Liberty Hill.

In Wardell 0.3 mile SW of
Little Barren Church is a fine
display of *Stromatococcus* just
under *Hebertosites* beds, a
conspicuous band of red rocks
occurs well under (100' or more)
under the *Hebertosites*.

The Belt of The Rose Hill
Lyon. Belt is like that at
Lone Mtn.

October 15

(5)

Breakfast

1.00

Lunch (2 days) 18+69

0.87

~~Supper~~

1.61

Bob Morristown

2.36

Visited St. Clair, Otes & Whitesburg. Big sink between Otes and St. Clair shows fairly thick layer of calcarenite or Effra limestone. The calcarenite is overlain by shale. Several cobbly (3) ~~lss.~~ bands seem definitely to be sandwiched in the shale.

The Otes cut suggests Whitesburg rather than Athens. Found Trinodus and Brontopora.

Oct. 16

Breakfast

0.81

Lunch

0.00

~~Supper~~

1.65

Bob Morristown, Tenn.

2.20

Went to Edison. Lucolusula shaley band with Dinorthis atavoides is very suggestive of Hogskin lithology. The rock also suggests cobbly Tenor but is much yellower.

Paleostrophomena is not at the base of the Benbolt but is near the base. The Wardell here is also quite suggestive of the Lone Mtn. Belt.

Oct. 17	
Tip at Middleboro	0.25
Breakfast	1.00
Lunch	0.00
Supper	1.65
Room Morristown nights	5.00

Visited Horn Hill - Evans Ferry belts. At Evans Ferry the graptolites come from just above Lowerbyites. Most of the *Strophomena* (large) are from above *Hesperotthis*.

Oct. 18	
Breakfast	0.75
Lunch	0.44
Supper	1.70
Store car	0.75
Grease car, gasoline	3.46

Visited Hagan & Station Creek Co.

Oct. 19	
Carter barn loc. is 0.55 mi NE of Δ	16.44
Room nights, Middleboro, phone	0.50
Car repair	0.80
Breakfast	0.44
Lunch	0.30
Tip	1.65
Supper	0.75
Car storage	

0741

(7)

Oct. 20

Breakfast

0.70

Lunch

0.12

Supper

1.65

Gas and oil, Abingdon

2.45

Car storage

0.50

At Eye Cove, Carters barn locality, shaly rocks form a bluff just down hill from the fossil bed at the barn. In the lower part of this bluff Benbolt fossils appear. Furthermore Williams found *Strophomena*, like *S. tenuesseensis* just down road from west angle of triangle opposite garage.

Visited Tumbley and Hansonville localities

Oct 21

Breakfast

0.70

Lunch

0.38

Supper

with B. N. Cooper

Lodging 2 nights Abingdon.

7.00

Telephone

0.81

Car storage

0.50

Gas (Wytheville)

2.44

0742

Oct. 22

Tip
Breakfast0.20
√ 0.75

Oct. 23

Car storage & antifreeze
Hotel 2 nights, Blacksburg
Breakfast√ 2.00
√ 6.00
0.75

Lunch

0.75

Supper

1.65

Gas, Buchanan Va

√ 2.47

Blacksburg to Harrisonburg with
visits to Dunkard Church & Green
Mount Church

Oct. 24.

Breakfast

0.75

Lunch

0.95

Car storage, Harrisonburg, Va

0.75

Room, Harrisonburg, Va

3.00

Tip

0.20

Gas, Winchester

2.63

1948

July 9

5.00 room

.85 breakfast

1.15 lunch

2.40 gas to oil

Collected Montoya on Scenic Drive and LK in morning. Collected Haplostiche beds (Georgetown fm - Weno - Paw Paw beds) on Christo Rey Mtn, on slope over and above RR Tunnel, about $1\frac{1}{2}$ mi E of Bowen, N.M. This is only local between El Paso & Frontier where H. texana occurs. Probably Conrads Type local.

10 July

.97 breakfast

3.22 gas

1.08 lunch

2.50 supper

Breakfast

Gas Bayard, N. M.

Lunch

Supper

0.97

3.22

1.08

2.50

4.55

July 11

Breakfast

Lunch

Supper

1.33

0.25

1.73

On July 10 visited locality at Georgetown and collected there all day.

July 11 went to locality 4 miles E of Santa Rita. Collected there about 3 hours. Collected on road $4\frac{1}{2}$ miles E of Santa Rita, then collected a wash on south side of road 5 miles east of Santa Rita.

Collected at Bear Mtn. from 4 to 5:30 P.M. Take Bear Mtn. Lodge road N of Silver City, pass turn-off to Bear Mtn. Lodge and continue on main road to locality $6\frac{1}{2}$ miles from Silver City. Percha is in bluff on N side of road.

July 12.

Breakfast 1.33
 Lunch 1.58
 Supper 2.10
 telegram to Marathon ARL .90
 9.8 Gas, car greased ARL 4.30
 3 day room 13.77
 23.98
 Collected at Bear Mtn in morning. Drove to El Paso.

366
 133
 501

July 13.

Breakfast 1.20
 Lunch ARL 1.70
 Supper ARL 3.00
 10.3 Gas El Paso 2.84
 Gas, Marfa, Texas 3.77
 hammer handle and wedges .35

July 14

Breakfast ARL 1.20
 lunch ARL .74
 Supper ARL 3.55
 Collected Word at Sullivan's Peak and Hess also.

July 15

breakfast ARL 1.40
 lunch ARL 1.29
 Supper ARL 1.70
 friction tape .15

July 15 - Split Tank -

July 16.

breakfast

ARL 1.25

lunch

ARL .84

10 gal. gas

2.80

Supper

2.15

Collected on W side Split Tank
and on N side road opposite Word
Ranch

July 17

breakfast

1.30

lunch

1.11

supper

1.90

Also Marathon

2.92

Lumber et al.

36.41

Quarry sacks

1.40

Groceries

1.65

Paint

0.15

Collected 706 C.
Went to Alpine
Packed boxes
on return.

July 18

breakfast

ARL 1.45

Supper

2.85

Collected Word ls #2 in morning
Worked on slope N of Hess Ranch
in afternoon. Packed 5 boxes. Box
labelled sponges is slope N of Hess Ranch.

July 19

breakfast

1.40

supper

2.00

Lunch

ARL .26

July 20

breakfast

1.40

lunch

0.76

supper

ARL 1.95

July 21

Breakfast

Lunch

Supper

Sub

A.R.L. 1.40

0.46

2.10

2.32

396

July 22

Breakfast

Lunch

Supper

Lumber for boxes

Hammer handle

1.40

1.70

1.85

11.29

0.89

Packed boxes all day — 25.

July 23

Breakfast

Lunch

Wire for tags

Supper

1.40

1.75

0.15

3.35

July 24

Breakfast

Lunch

Supper

Hauling boxes

Room 12 days

Laundry

Pencil leads

Mexican labor

1.50

1.25

2.25

4.00

60.00

6.65

0.05

0.50

0749

July 25

Breakfast

1.40

Lunch

2.15

Supper

1.50

Gas McCamey 13 gals.

3.72

Miss Earlene Fallis

Parkway Hotel

Marathon, Texas.

Gas Coleman

3.40

Room, Cisco

5.00

July 26

Breakfast

1.20

Grease job

4407

1.25

Lunch

1.55

Supper

2.15

Return Breckinridge

5.00

July 27

Breakfast

1.65

Gas Breckinridge

3.56

Lunch

1.00

Supper

3.10

Return Fort Worth

6.00

July 28

Breakfast

1.25

Lunch

0.37

Gas + oil

3.91

Supper

2.00

Cabin Jacksboro

4.50

July 29

Breakfast
Lunch
Supper0.95
1.40
3.50
5.85July 30
Breakfast

1.30

Supper
10 gal. gas1.90
ARL 2.39July 31
Breakfast
Lunch
Supper
Gas1.30
1.40
5.50
2.772901 Bonmar
Ft. Worth 3, TexasAug 1.
Breakfast
Lunch
Candy1.30
4.10
2.00

August 2

Breakfast
Lunch
SupperRoom + Laundry Ft. Worth, freight
Gas, Ft. Worth1.20
2.05
2.64
27.17
3.38

August 3.

In Spring Creek section, platy limestone between Hesperotthis and green bed sand. massive limestone is packed with Strophomena. This probably is about equivalent to the upper part of the section at Criner Hills (Rock Crossing).

Breakfast
Tolls
Lunch
Supper

1.22
ARL 0.40
2.10
2.24

August 4

96

Arbuckle lay 2 blocks collected,
East side OKla 18, 3 miles S of
Nebo store, Carter Co., OKla. about
center 2-3 S-3 E.

Oil Creek on OKla 18, 2 miles S
Nebo store.

Sulphur locality is 1.8 mi. S of
Sulphur.

At Sulphur locality lower part
is common on west side road
at top of cut. Base of "reef" on
west side road is very sandy.
all beds on both sides of road
belong to green shale
interval of Brownide. On east
side road not far over fence
Hesperotthis occurs. Probably
the Criner interval.

0752

August 4

Breakfast 1.21
 Gas Sulphur 2.42
 Room, Sulphur, 2 nights 11.22
 Gas Muskogee, break job 4.43
 Went one mile east from Ford.
 Room Muskogee 2 nights 8.00
 Supper 2.44

August 5.

Breakfast 1.48
 Lunch 1.33
 Supper —
 Sacks 0.98

Aug 6

Breakfast 1.33
 Lunch 1.38
 Nails 0.46
 Supper 2.40
 Return, Vinita, Okla. 6.00

August 7.

Leeblich has \$14.83
 Breakfast 1.22
 Gas Vinita 3.87
 Lunch 0.50
 Room (Bartlesville) 6.00

Aug. 8

Lunch 1.58
 Gas (Independence) + oil 3.47

Leebich's locality is 5 mi N
 of Copart to A on US 75, 2 1/4 mi. E
 of US 75, NE 1/4 SW 1/4 23-29 N-13 E,
 Washington Co map, Okla.

0753

August 9.

Lunch	1.92
Gas Fairfax, Okla.	3.92
Supper Vinita	1.83
Rd m Vinita	6.00

Aug 10

Breakfast	1.12
Lunch	0.97
Gas Nowata	3.42
Cabin 2 nights (Muskogee)	10.00
Supper	3.06

August 11.

Breakfast	1.43
Lunch	0.93
Supper	2.55
Gas Tahlequah	3.42
Burlap sacks	0.70

Harrell L. Stumple
412 Wyandotte
Bartlesville, Okla.

August 12

Breakfast	1.33
Lunch	0.54
Supper	3.00
Room 2 nights	10.00
Tip (dinner)	0.25

A.R.L.

Aug 13

Breakfast	1.32
Breakfast	1.00
Tacks, Bags	0.35
Lunch	1.15
Supper	3.11

0754

Aug 13 cont'd

Gas Muskogee

4.09

Aug 14

Breakfast

Lodging Muskogee

Lunch

Supper

1.28

5.00

1.74

3.56

5.58

On Aug. 14 Al had 14.58
I turned over 20.00

Total to Al

34.58

Aug 15

Breakfast

Lunch

Gas, Tulsa

Check bags

Supper

Mileage 6990

1.12

0.58

3.89

0.20

0.97

168
97
765

Aug 16

Breakfast

Porter tip

Lunch

Supper

1.48

0.25

1.53

2.45

5.71

0755

①

Trip to Minnesota and Mississippi Valley 1949

June 15
 Convert \$900 to travelers cheques 6.75
 Purchase liability insurance 10.50
 June 16
 Sponge rubber for seat 3.00
 2 Rucksacks 7.09

Mileage at 20740 start

June 20
 Lunch 1.39
 Gas Berryville, Va 15.1 4.47
 " Clarksburg, W. Va 12.7 3.81
 " Chillicothe, Ohio 12.7 3.57
 Supper 2.42
 Lodging, Hillsboro, Ohio 5.00

139

242

3.81

June 21
 Breakfast
 Lunch

June 21
 Breakfast 1.07
 Lunch 1.20

June 22
 Gas Springfield, Ohio 12.7 3.10
 Lunch 1.03

1.03

242

Gas Dundee, Mich. 12.5 3.46
 Supper 2.42
 Lodging Dundee Mich 4.00
 Collected Silica shale for 3 hours.



288

96

192

0756

(2)

June 23

Breakfast

Lunch

gas. Bay City, Mich. 9.0

Dinner

Lodging Alpena (1 night) see below

Supper

Recreation

See below

1.13

1.45

3.34

5.92

~~1.13~~~~1.80~~~~2.40~~~~1.45~~

5.00

3.34

1.92

June 24

Breakfast

Canteen

grease job

gas. Alpena, Mich. 11.1

Supper

Foot - (for lunch)

1.41

2.36

3.77

1.92

5.69

~~1.41~~~~1.63~~~~1.00~~~~3.12~~

2.36

53

June 25

Breakfast

Supper

~~1.13~~~~3.00~~

1.13

3.00

.53

4.66

June 26

Breakfast

Supper

~~1.35~~~~3.80~~

June 27

Breakfast

Dinner

Supper

Gas.

Lodging 5 nights Alpena

1.13

1.55

1.90

4.58

1.13

1.55

1.90

~~3.13~~~~3.14~~

25.00

11.2

$$\begin{array}{r} 3.35 \\ 1.38 \\ \hline 4.73 \end{array}$$

(3)

June 28

1.13
1.44
2.58
5.15

Breakfast
Ferry at Mackinaw City
Lunch
Gas, Manistique 13.4 gals.
Supper
Cabin Escanaba

~~1.13~~
~~2.50~~
~~1.44~~
~~3.95~~
~~2.58~~
~~4.50~~
16.10

June 29

0.93
1.140
2.25
4.58

Breakfast
Gas, Laona 12.5
Gas Ladysmith, Wis. 10.2
Lunch
Supper
Cabin

~~0.93~~
~~3.73~~
~~3.01~~
~~1.40~~
~~2.25~~
~~4.00~~

June 30

Breakfast Lunch at Univ. of Minn. 0.90
Cabin 4.00
Gas 10. gal 2.96

July 1

Breakfast
Lunch
Supper

3.80
0.90
1.35
1.55

July 2

Breakfast
Lunch
Supper

3.95
1.10
0.60
2.25

④

July 2

$\frac{1}{2}$ mile sand east on road just at
 south end of Cannon Falls, full section
 of Middle Ord. St. Peter and Glenwood
 Exposed just east of junction with
 U.S. Hy. 52. Mc Bugor well exposed in
 small cys. about $\frac{1}{4}$ mile east of
 junction. Specht's Ferry on road-
 side just beyond (east) of Mc Bugor
 exposures. One mile east of junction
 with U.S. 52 is an exposure
 abounding in cup corals, *Rhynchotrem*
Durothia pectinella, and small
 conical *Protopora*. This I believe
 to be Gutterberg. The same material
 occurs on the N side of the
 road about 0.1 mile east of
 Gutterberg. Here *Pionodonta* is
 fairly common with *Pessicella*.
 On south side of road 1.1 mile
 from intersection is a bank
 with crumbly limestone which
 overlies the Gutterberg material.
 This contains *Clitambrites*,
Platystrophia, *Rafinesquina*, etc.
 is the Elon or Prosser.

(5)

July 3 -

Breakfast

1.35

Hill just east of Chatfield on Minnesota Hy 74. Top of platy ls contains *Eozygia* and *Phonodema*. In shale just above ls. comes abundance of *Doleroides* and *Phonodema*. The *Doleroides* are like the fine ones in the USNM coll. which are probably from this horizon.

Lunch

Supper

Cabin 3 nights

1.35

1.60

2.50

5.45

1.60

2.50

14.25

Send list to Charley Bell of species on which I need locality data.

July 4 -

Breakfast

1.00

gas

gal. 9.4

2.81

Lodging Charles City

4.00

Lunch

1.02

Supper

1.89

1.00

1.02

1.89

3.91

July 5

Breakfast

1.02

Grease

3.88

Gas 10 gal }

Lunch

1.07

Supper

1.53

Cabin 2 nights Decorah

10.00

1.02

1.07

1.53

3.62

July 6

Breakfast

~~0.80~~

$\frac{3}{4}$ mile NE of Ft. Atkinson on Iowa
24. good exposures of Ft. A. shaly ls &
dolomite overlying greenish shale
of the Clermont member. Few fossils
in either formation.

Fayette Co map.

~~0.15~~

Lunch

~~1.15~~

Supper

~~1.84~~

Excellent locality for Clermont
of Maquoketa just south of
Turkey Creek opposite Eldorado,
Fayette Co. Large Austriella common

July 7.

Breakfast

~~1.02~~

Bridge toll

~~1.00~~

Gas 18 gal 1 qt. oil

~~2.98~~

Lunch

~~0.75~~

Cabin, Mineral Point, Wis.

~~4.00~~

Supper

~~1.80~~

July 8

Breakfast

~~.95~~

Lunch

~~1.20~~

Cabin Golconda, Ill.

~~4.00~~

Gas,

~~2.79~~

Supper

~~1.72~~

0.80
1.15
1.84
3.79

Balance job 23/00

1.02
0.75
1.80
3.57

.95
1.20
1.72
3.87

(7)

Top of Plattville is marked by an 8" bed of blue clay. Under the clay occurs a zone of abundant *Pirnodema* of large size together with a large *Doleroides*. Just above the shale occurs a flood of *Rafinesquina alternata*, large *Lowerbyella* and *Resserella*. This is mapped as base of Galena and is the Guttenberg of Kay. It also contains a large *Strophomena* called *S. subburnensis*. *Glyptothrips* is abundant 5-10' above the blue clay. The large *Lowerbyella* and *Rafinesquina* suggest the shaly beds above the Plattin in Missouri.

July 9

Breakfast

Lunch

Phone to Iowa City

Telegram to Brandon

Supper

Robt, La Salle, Ill.

7.04

1.22

0.90

0.55

1.92

4.00

1.04

1.22

1.92

4.18

July 10

Breakfast

Bridge toll

Lunch

Gas 12 gal. West Liberty

0.87

0.15

1.22

3.39

0.87

1.22

2.09

12

30

360

⑧

July 11

Breakfast

Lunch

Supper

Sunday

July 12

Breakfast

Lunch

Gas & oil

Supper

Lodging Iowa City
on A.K.M. 4.04

1.02

1.33

1.69

7.73

1.02

1.33

2.31

2.11

4.46

7.6 gals.

July 13

Breakfast

Gas

Gas

Hotel

Supper

12 gals.

8 " "

2 credits

Vinton Iowa

Kokub "

Vinton Ia

Failed to file receipt

1.02

3.45

2.24

5.50

1.84

July 14

Breakfast

Room

Lunch

Gas 11.7

Supper

Hotel

Caber

Palmyra

Baraboo

(Kohler City, Mo)

0.97

1.40

3.00

2.33

4.08

3.08

1.02

1.84

Lunch 2
1.33

4.19

0.97

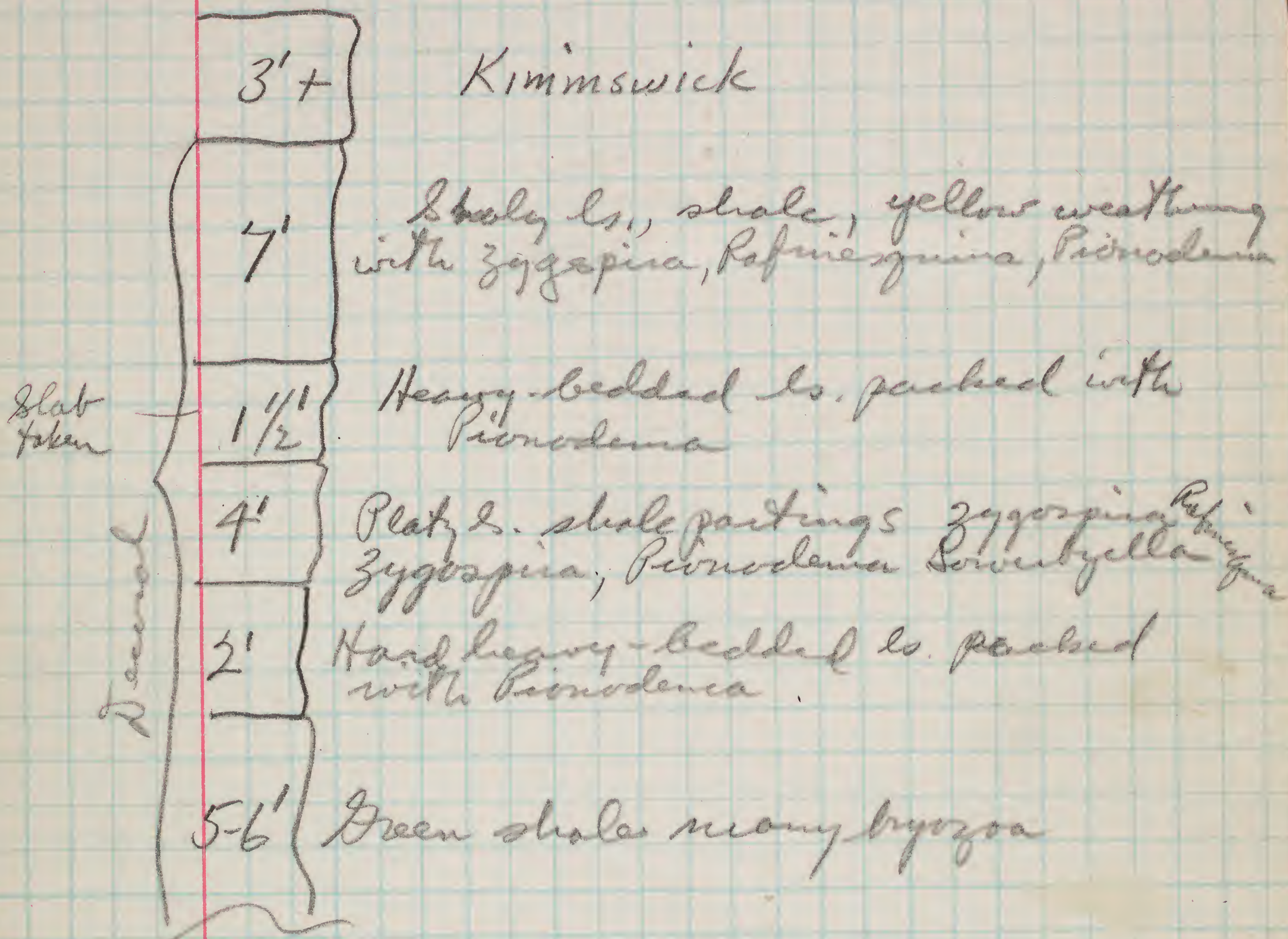
1.40

2.33

4.70

⑨

Koch Schicht



Abundance of *Rafinesquina*, *Zygospira* and *Pionodema* with large *Sowerbyella* date this as Guttenberg. It looks to me like the beds just overlying the Specht Ferry in Wisconsin.

$$\begin{array}{r}
 11.25 \overline{) 1000} \quad (88 \\
 \underline{9000} \\
 1000
 \end{array}$$

(10)

July 15

Breakfast

~~1.00~~

1.00.

Gas 8.1

~~2.10~~

0.89

Lunch

~~0.89~~

3.31

Supper

~~3.31~~5.20

Car service

~~6.47~~

Boxes up to July 15

Alpena Michigan

3

540 pounds.

Calmar, Iowa

2

314

Vinton, Iowa

3

560

"

Murfreesboro

2

400

"

July 16

1814

Breakfast

~~1.33~~

Room Cape Girardeau

~~4.34~~

Bridge

Lunch

~~0.75~~

Gas Mayfield Ky 10 gals.

~~3.10~~

Cabin 2 nights

~~11.36~~

Gas Murfreesboro 12 gals.

~~3.84~~

Supper

~~3.00~~

1.20

1.33

3.00

5.53

On my collections of 1939 the
beds with *Sowerbyella*, *Zygospira*
large *Hesperothiris* are *Platystrophia*.
The *Campylorthis* is *Platystrophia*.

Test mileage run start 61.05

End 10 mile strip 72.30

Mileage 11.25

Factor for correction .88

$$1.1 \overline{) 100} \begin{matrix} 90 \\ 9 \\ \hline 10 \end{matrix}$$

$$15 \overline{) 10} \begin{matrix} 266 \\ 90 \\ \hline 10 \\ 90 \end{matrix}$$

$$11 \overline{) 5.66}$$

$$91$$

$$\begin{array}{r} 24600 \\ 88 \\ \hline 19680.0 \\ 196800 \\ \hline 2164800 \end{array}$$

$$\begin{array}{r} 24600 \\ 12 \\ \hline 49200 \\ 24600 \\ \hline 295200 \end{array}$$

(11)

July 17

Breakfast
Lunch
Supper
Cabin

1.17
1.33
3.00
5.66
11.36

17.02 add

Large quarry in Ridley, on S side
US 705 about $2\frac{1}{2}$ miles east
of Murfreesboro. About 20' of rock
exposed. Probably lower Ridley. Abundant
in Tetradium and Stromatocellium.

The position of Readyville should
be checked. The fossils we have
come from just about $\frac{1}{2}$ - $\frac{3}{4}$ mile
east of the county line (Rutherford-
Canon). Readyville itself is
given as east of the Canon
County line. Try to get a
topo sheet for the locality.

At Readyville Sowerbyella is
abundant just above the
Cryptophagus zone, not below
it as previously supposed.

1136
526
1702

(12)

July 18

Breakfast

Lunch

Supper

4.62

1.28
1.30
2.04

Lebanon outcrop on US 41 is 9.6 miles SE of Murfreesboro. and 0.8 mile SE of Hurricane Creek = Knox Branch. The large quarry is 11.7 miles SE of Murfreesboro. The first locality is about $1\frac{1}{4}$ - $1\frac{1}{2}$ miles NW of Mt. Olive. The material from latter place should be relabelled.

July 19.

Breakfast

Cabin 2 nights

Lunch

Gas Nashville, 10 gals

Supper

0.97
1.33
2.50
4.80

0.97
9.32
1.33
3.10
2.50

July 20

Breakfast

Lunch

Supper

4.79

1.11
1.18
2.50

Exposures called Leipers on 70N near Charlotte road are actually Catheys. The labels must be changed.

0767

1.20
80
200

13

July 21

Breakfast

Lunch

Supper

Gas, Linden, Tenn.

1.20
0.90
1.84
3.94

1.20
0.90
1.84
3.15

July 22

Breakfast

Lunch

Supper

3.23

0.92
1.00
1.31

July 23

Breakfast

Room 2 nights Linden

Gas Parsons, Tenn 12 gals

" Forrest City, Ark 12 "

Lunch

Supper

Gas + Oil, Arkadelphia 8 gals.

0.87
1.22
0.97
3.06

0.87
10.00
3.74
3.66
1.22
0.97
3.01

July 24

Breakfast

Lunch

Supper

Return Arkadelphia

Gas Mt. Pleasant, Texas

Car Repair Arkadelphia

1.14
1.24
1.90
4.28

1.14
1.24
1.90
4.25
2.81
4.50

(14)

July 25

105	Breakfast	1.05
140	Hotel Greenville, Texas	4.50
205	Lunch	1.40
450	Supper	2.05
	Hardware & water bag	2.76
	Gas & grease job, Cisco, Texas	3.92
	Gas, Fort Worth, Texas	2.92

July 26

105	Breakfast	1.05
115	Room Cisco, Texas	4.00
245	Lunch	1.15
465	Supper	2.45
	for 2 boxes sent off from Cisco	

July 27

120	Breakfast	1.20
150	Gas	2.80
300	Lunch	1.50
	Room Sweetwater	4.00
	Gas Hobbs, N. Mex.	3.05
	Tire, wheel, fix car	46.45
	Cabin, Whites City, N. Mex.	5.44
	Supper	3.00

(15)

July 28

Breakfast
Lunch
Gas (White City)
Cavern Trip

+1.53
-1.00
-2.79
3.00

July 30

Gas Pine Spring Camp, Texas
Telegram to Parkway Hotel

+1.30
-0.85

July 31

Lunch
Gas, Van Horn, Texas
Supper

+1.94
-2.28
-2.75

1.94
2.75
4.69

Squamulina blocks - mouth of
McKittrick Canyon, $1\frac{1}{2}$ mi. ESE of Section
12 well, $3\frac{3}{4}$ miles ESE of Pratt Lodge,

Middle La Mar ~~Guadalupe Peak~~ [?], Texas

Getaway Limestone, S side US 62-150
2 miles south of Pine Spring
Camp, Texas.

at entrance to Guadalupe Pass
Summit & radio station

August 1 M

Breakfast
Lunch
Supper
Sax, Marathon, Texas
& hammer handles

+1.30
-0.97
+1.90
-2.38
+1.78

1.30
1.97
1.90
4.17

(16)

August 2 Tues

Breakfast

Lunch

Supper

Paint + brush

20 bags for packing

August 3 Wed

Breakfast

Lunch

Supper

Lab, Marathon

9 burlap bags for packing

August 4 Thurs

Breakfast

Lunch

Supper

27 bags for packing

15 sacks. " "

125 shipping tags

Car service, gas, oil, tire

Blew out left rear tire

August 5 Fri

Breakfast

Lunch

Supper

Belt lacing (1)

August 6 Sat

Breakfast

Lunch

Supper

Wire for tags

Laundry

1.45
 .87
 2.15
 4.47

1.45
 1.04
 2.20
 4.69

1.40
 1.14
 2.00
 4.54

1.45
 0.87
 2.15
 0.85
 1.00

1.45
 1.04
 2.20
 2.80
 0.90

1.40
 1.14
 2.00
 2.70
 1.50
 0.50
 33.96

1.35
 1.13
 2.10
 0.50

1.35
 1.50
 1.95
 0.20
 4.73

458

480

(18)

2.96
30
20

August 7
 Breakfast
 Lunch
 Supper

~~1.50~~
~~1.50~~
~~2.00~~

August 8

Breakfast
 Lodging 8 nights Marathon
 Lunch
 Supper
 Gas, Fort Stockton, Texas 12.1
 " San Angelo " 11.3

~~1.60~~
~~42.00~~
~~1.05~~
~~2.10~~
~~3.37~~
~~2.94~~

160
 105
 210
 475

August 9

Lodging Coleman, Tex.
 Breakfast
 Lunch
 Gas, Stephenville 11 gals
 " Gainesville 10 gals
 Supper

~~5.50~~
~~1.05~~
~~1.00~~
~~2.75~~
~~2.70~~
~~3.46~~

185
 100
 346
 551

August 10

Breakfast
 Lunch
 Supper
 Lodging Sulphur

1.38
 1.43
 2.30
 5.11

~~1.38~~
~~1.43~~
~~2.30~~
~~3.06~~

Falls Creek - Baptist Camp

(19)

140

Lower part cobbly ls. with
grayish shale, remainder greenish
shale with ls. beds. Top 30'
with *Sowerbyella*. I think this is top
of green shale at Spring Creek

3'

massive cobbly ls.

30'

green sh with small ls. cobbles
Bygonia elongata & *Minella* zone

3'

massive cobbly ls.

12'

cobbly ls + green shale. Many
Bygonia, small *Valcoura* zone

25'

massive ss + cobbly ls.

20'

greenish shale with } suggests
Macroschisma, *Minella*, *Opikina* } *Sowerbyella*
zone

75'

thin bedded ss. + ls.
with green shale.

105'

green sh with thin ls + ss bands

15'

thin bedded ls + green sh
small *Microscopula*
massive thick ss
Brownish (base)

On highway between Falls Creek
and Hy 77 at hairpin loop Bridge
well exposed. Base with small
Valcones occurs above a thin sand
in field at middle of hairpin
bend just southeast of observation
point. Followed by green shale &
thin ls. Massive white ls beds
occur at N end of hairpin bend
about 0.5 mile below observation
point. At base are Murina (large)
and large Sowerbyites. Higher
come shales with Sowerbyella
followed by more massive ls
with Camarella 50' below top
uppermost beds contain
Ancestrorhyncha and are
much like Calcuttya. The
sequence is suggestive of Hy 99.

66 pieces
Whitish?

07741814

200 pieces to pinella
in iron-stained beds.

(20)

August 11

Breakfast

~~1.00~~

Lunch

~~1.06~~

Supper

~~1.70~~

Gas 12.8 gals, Sulphur, Okla.

~~3.72~~

August 12

Breakfast

1.25

Lunch

1.22

Supper

3.60

6.07

August 13

Breakfast

~~1.25~~

Village of Benwyn, Okla. now
called Gene Autry.

Lunch

~~2.00~~

Supper

~~2.20~~

August 14

Send Bill Ham a copy of The
Cloud paper on Canadian brachiopods

28194 mileage in
Norman

meals

Fodging

Davis Okla

Parish Valley, Okla

~~3.75~~

~~12.00~~

~~5.70~~

$$\begin{array}{r} 87 \\ 77 \\ \hline 164 \end{array}$$

$$\begin{array}{r} 184 \\ 379 \\ \hline 563 \end{array}$$

(21)

August 11 visited the Brownide type section just NW of Brownide. The section had no bottom but I found a block with Valcourea in the float which shows the small Valcourea zone to be present. Above a thin ss. comes shaly beds crowded with cystids and Minella. Art. Jr. thinks this is the same bed as the thick mass of bygon on Hy 99. Above this came breccias generally moderately bedded and iron stained. The upper Brownide consists of some 60-80' of light gray moderately bedded limestone containing Arcistrohyncha at the top. The sequence is thus like that at Falls Creek & Hy 99. The Viola overlying the Brownide is granular, yellow-gray ls. abounding in chonetes.

1949 notes.

(72)

1. NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec 9, T2S, R1E, Murray Co., Okla.
Middle Kindblade
2. Center Sec 5, T2S R1E, Murray Co.,
Okla. (1 mi SE of Windmill)
Upper Cool Creek
3. Center NE $\frac{1}{4}$, Sec 6, T2S R1E, Murray Co.,
Okla. (approx 300' below top)
Upper Cool Creek
4. SE $\frac{1}{4}$, SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec 16, T1S, R1W,
Murray Co., Okla. (90' above base)
Lower Signal Mtn.
5. Cen. S $\frac{1}{2}$, Sec 29, T1S, R1E, Murray Co.,
Okla.
Upper Signal Mtn.

28194

20740

7454

.8

5963.2

11.25) 10

(8)

(23)

Aug 15

Breakfast
Supper1.64
2.80~~Shipped from Norman 563 Bk.~~
~~Liability Insurance~~

0.10

To Al Leeblich 40.00

Purchase of liability insurance
for Bill Allen

16.85

To Dr. Frank Jappan
452 College St., Norman, Okla.

Windshield wipe

(0.25)

Aug 16

Breakfast
Lunch
Supper1.10
1.58
1.85
4.53In section NW of promide there
is no bottom but small Volcanic
was seen. Top has ancient rolling hills
The section is like Hy 99.

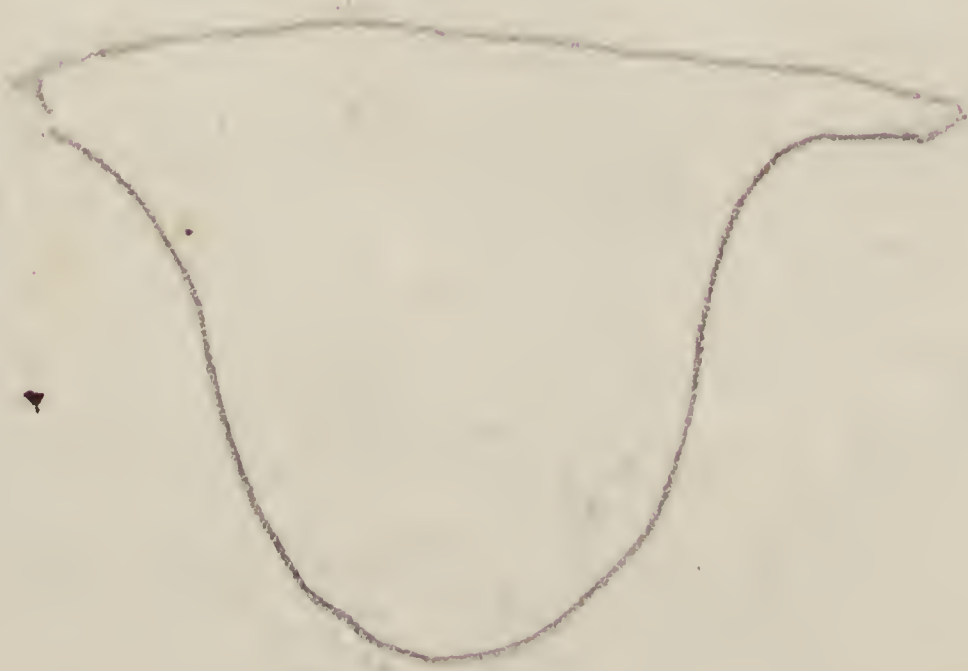
Aug 17

Breakfast
Taxi to home
Porter tip1.25
0.40
0.25

Trip to Pennsylvania and
New York Oct. 1, 1949 - Oct. 15, 1949

Nagimay
Malamont 135

Stover - 37
Snyder - 66



①

Trip to Pennsylvania

Oct. 1-15, 1949

Section in "Stones River" ls. on NE side
of Middle Spring Creek, Middle Spring, Pa.

292'
horizon

Dark finely granular ls. cherty near
base, lithologically suggestive of
Chazy of Mosheim section. Top of
this interval is at sharp bend of stream
at Middle Spring

$N43^{\circ}E 54^{\circ}S$

260'
horizon

Massive blocky fracturing light gray ls.
weathering ash white. Suggest Mosheim
type

230'
horiz.

Dark fine grained to finely granular
ls.

Hesperotia?, Opikina in loc.?

8' horizon

cherty dolomitic, dark gray ls. $N35^{\circ}E 66^{\circ}S$

83'
horizontal

Dark gray to nearly black brittle, irregular fracturing ls.

200'
horizontal

Massive ls. forming small shallow quarry. 50'
very fine grained - Mosheim-like
of massive beds full of fossils. All rock wealy
dark gray but much lighter than below

120' horiz

Dark gray to black wealy fracturing and thin-
bedded ls. weathering ash gray. Mostly somewhat
platy

dol.

②

Gas, Washington D.C. 12 gals.

3.30

Lunch

1.00

Gas, Everett Pa, 10 gals

2.85

Supper

1.25

Oct. 1. Left Washington 7:15 A.M. and went directly to Shippensburg to visit section at Middle Spring. Good section of "Stone River" on Middle Creek but failed to find and exposures continuous enough to build a section either on Pa Rte 696 or in the field, to the south. Sporadic exposures occur along a dirt road due south of Middle Spring. Oranda appears by the roadside (Rte 696) at the north end of Middle Spring.

We also visited Kay's locality of posthum opposite the mill at Waterside. There dark massive bluish limestone with interrupted partings often deeply pitted. This is overlain by sparsely fossiliferous shaly ls. said to contain Ancistrorhynchia and Campylorthis. The conibrations sounds more like Wandell to me than like Beubolt where Kay places it.

October 2

Breakfast

0.60

Supper

1.65

Groceries

0.68

2.93

(3)

Quarry of New Enterprise Stone and
Lime Co. NW end.

Trunk black, blocky limestone

50'

Rodman. Rough weathering ls. ash gray on
surface, dark gray inside. Granular bed 10-15'
thick near base

135'

"Lowville" - various types dark, light-
gray-weathering ls.

35'

Lemont = Hatter - silicious ls. with
large *Campylodictya*

60'

Grazier - base not determined
massive, mottled ls.

Collected Rodman on Penn. RR 1/2
mile north of the station. Rodman
65-70' thick with massive calcarenite
at base. Pennsylvanian Leptaenoid occurs
at the base. Camarocladia markings
abundant at base of section

④

Rodman ls on Pa. Hg 164 at
east end of East Sharpsburg.

Covered

5'

8"

10'

3'

6'

23'

Black cobbly weathering, Trenton-like ls.

dark gray mealy, mottled weathering ls.

Dark gray platy granular ls. with
up 4' weathering cobbly. Has peculiar
filled Leptaena

Dark gray cobbly or platy ls. with many
bryozoa, Zygospira. Has interbedded black
cobbly ls.
massive dark smooth to granular ls.

Coarse granular ls. a lime sand
bank. 10' above base occurs a 2'
band of black ls. On top of the black
ls in the coarse lime sand occurs
the filled Leptaena

Covered

(5)

Oct. 3 Garminster - Dy on N side R., east
side of Garminster N 58° E 47° N

Tunton More shaly & silty than in belts
at Rearing Spring and Martinsburg

30-40'

Black shaly-weathering limestone
grading upward into a silty calcareous
shale rock.

225'

horizontal

200'±

Massive, weathers with skin
Lowville mealy fracture

270'±

alternating limy siltstone and
Hotter limestone. Siltstones much
mud-cracked.

45'

Massive gray, ribbon-banded
Grazier breaking dense, fine grained.
Fossils abundant but poorly preserved. Large
Opikina, Campylodictya. Auctirothis "Cress" form

30'

Light, whitish gray, Tetradium-bearing
Clover ls.

Loysburg - Banded, massive, earthy gray ls.

⑥

Oct 3 Union Furnace

West end of quarry on west side anticline.

At west end quarry Toysburg base not found but rock answering to Clover appears near base and for 30-40'. Brazier is present in massive blocks separated by shale partings and abounding in massive *Tetradium*, large *Opilina*, *Strophomena*, *Mimella* and *Glyptorthis*. No *Hostler* seen at west end. Brazier often coarsely granular. *Tetradium* often makes lumps in shaly partings. The *Tetradium* beds are the Eye fm. of Kay.

Breakfast	0.60
Room 2 nights Hollidaysburg	4.00
Lunch	0.50
Groceries	0.59
Car storage, Tyrone	0.75
Supper	1.10

On the east limb of the syncline the *Hostler* abounds in fossils. *Opilina* and true *Strophomena* are common. It strongly suggests the Ridley to me.

60
50
110
59
219

19
5/95

0784

Warner Co. Crushed Stone & Ballast
Union Furnace Plant.
Union Furnace

According to Kay
In RR cut N 20° E 55° W

23'

Rodman

138'

Base with Columnaria, heavy-
ledged, mottled. Lambeophyllum
Mealmont Brown partings, not as close together
as Stover. Not pitted like Stover

91'

Stover Heavy-ledged, dark, medium-fine
Texture, with undulating silty partings,
speckled Stromatoverium & Syntactospira (at top)
to. Camarocladia, Cryptophyllum.
Riddled with holes

98'

Snyder Light colored detrital ls. with ls.
Many ostracod pebble congl., white-weathering dense
with Tetradium. Cryptophyllum rare
Coral-like Tetradium but without Septa

62'

Hostler Tan weathering silicious ls., many
fossils. Strophomena. Surfaces often
ripple-marked

33'

Grazier Dense, heavy-ledged, with wavy
partings. Full of fossils -
Glyptothiris, big Epikina, Strophomena, Mimella

61

Eyer ls. Calcarenite with massive Tetradium

68'

Clover

40'-80'

Laysburg alternating ls & dolomite with
thin layers of ostracods.

②

Oct. 4

The beds above the *Nidulites* zone in the Strasburg region are lithologically suggestive of the Nealmont ~~of~~ ^{at} ~~Richcastle~~ ^{redefined}.

At west end of Pa RR cut on N side of track 5 Stover surfaces show small *Opikina*, *Ceramus*, *Hesperorthus*, *Chocrinus*, *Reticellula*, *Camaroclada* a *Leptaenoid*.

On the north side of the RR cut continuous exposures of Clover-Stover are present. The Lydel brings in a white weathering interval with ls congl. in the upper 3/4. The Stover is suggestive of Grazer lithology but on a smaller scale. The rock is definitely pitted by irregular pits which may be weathered-out *Camaroclada* or worm borings.

Breakfast
Car Storage
Gas, 10 gals. Tyrone
Supper

0.60
- 0.75
3.00
1.27

9

October 5.

Section 1 mile west of Tusseyville
on U.S. 322.

Measurements from Kay.

I would put the basal 8' of Rodman
with the lower beds on lithology.

26'

Rodman - Basal 8' with thin black chert
and light-gray-weathering thin layers. Upper 18'
dark gray, diab, not bluish, locally very dark
gray ls. Surfaces peppered with animal debris.
A bentonite 16' below top not in Kay's section.
Bilobea, *Strophomena*,

44'

Centre Hall - Shaly weathering, blue-weathering
dark gray limestone.
Doleroides, *Anostrophia*, *Strophomena*, *Maclurea* C,
Hesperorthis, some mottled worm tube layers.

8'

Bentonite

18'

Oak Hall - Dark gray, locally fracturing
limestone with heavy, angular bedded
blue gray weathered surface. Surfaces
Benton rough. *Amurocladia* or worm-brines not
frequent, ^{but present} *Hesperorthis*, *Enails* common.
Sowerbyella, *Strophomena*, *Nidulites* (like
in Lebanon). *Maclurea*.

39'

26'

Stover - Blue gray weathering, very dark gray
limestone moderately heavy-bedded with
some worm-bored layers like the main
mass in the R.R. at Pemberton. Thin
layers of calcarenite at top. *Cryptophragma*
in lower part, large *Zygospira* and
Perticellula at top. *Strophomena*

Quarry at Center Hall just NE of RR Sta.

N side quarry in Oak Hall ls. here angular blocks with yellow Camero-cladia surfaces containing small *Pionodema*, *Dalmanites*, *Opikina*, *Strophomena* a, and *Hesperonthis*. *Maclurea*.

On S side quarry Center Hall makes up most of wall. Thin bedded, but often heavy-bedged shaly weathering limestone with yellow surfaces.

Breakfast

0.60

Lunch

0.32

Lodging 2 nights, Tyrone

5.00

Supper

1.75

207

Visited type Locality of Butts along The RR south of Lenoir from Milepost 58 to Road crossing. The section is Trenton-Rodman at the road-RR crossing and then Center Hall (Nealmont), possibly some Oak, but I am not sure.

→ Hall

(11)

October 6

160
175
335

Breakfast

0.80

Lunch

0.80

Supper

1.75

Preston 1 gal

3.50

Quarry on 1/2 mile N of Bellefonte
in gap and along Pa Hy 53.
N50°E 60°W

Nealmont here must be rather thin.
Unless the 15' massive beds are Oak Hall
and the remainder Centre Hall - Rodman
we were unable to make any divisions.

Roadside

20-30'± Nealmont, lithology not like Rodman
or Centre Hall

Top of quarry

Valley View → Nealmont

20'±

Dark gray rough-weathering
limestone breaking into lumps
2-3" thick

15'

Massive ledges, very dark gray ls., hackly
in fracture

40'±

Hard impure massive ls. some
chert, brown weathering skin.

10'

8" metabentonite
cherty heavy bedded, dark gray (brownish)
metabentonite E 3-4" bentonite but 1 1/2" zone of shaly ls.

60'

Stover - Heavy-bedded ls, dark gray fracture

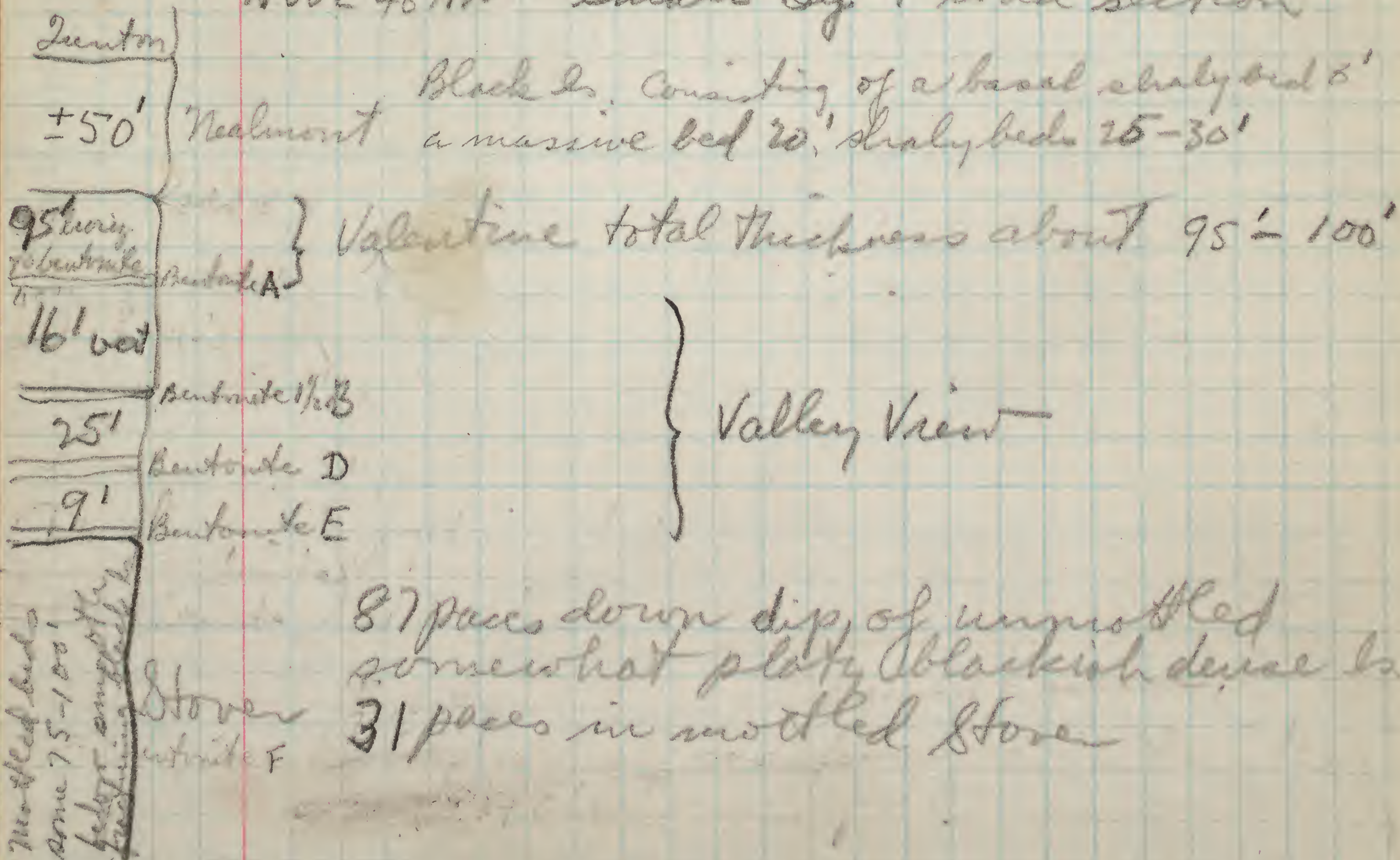
(12)

Starting from last short street in
Belleville 78 paces down on 53
are dark somewhat platy ls.
trending $N60^{\circ}E$ $57^{\circ}NW$. They fracture
black

33 paces further north come
black fracturing blackly fracture
ls to the lowest Bentonite. These
weathered surfaces of this rock have
the peculiar irregular pits suggestive
of Ore Stover.

Both divisions of rock here are
much blacker than either Snyder
or Stover at Pemberton. Are we
dealing with facies of Hatter with
The Valley View - Valentine being
equal to Snyder + Stover?

$N60^{\circ}E$ $48^{\circ}NW$ - Small Oz. + road section



(13)

95'

Top of Valentine
Bentonite A

Bentonite A-B = 16' 10"

B-C = 25'

C-D = 9'

Contains *Rosinella*
Contains *Rosinella*

Visited quarry on NE side of Bellefonte. Here occurs a much thicker *Nealinita* which seems to lie unconformably on *Valentinita*. The westernmost end of the quarry has a considerable thickness of mottled rock and geotrite of the Stover but much darker in color when fractured. All of the quarries seem to show *Bellefontina* and was unable to detect any *Snyder*, evidently Stover rests on the dolomite. We saw no *Clower* but *Bellefontina* at all.

(14)

Oct. 7 - Anteo Gap. Locality on road about $\frac{1}{4}$ mile E of junction of Pa 44 and road to Oriele. On N side of road about 15' of coarse calcarenite breaking platy is assigned to Rodman. Shaler material above is placed in Salona. Kay took *Porambonites* here. We also took one in quarry at road junction from thin beds Kay himself calls Salona. On S side of cut is a steep bluff having calcarenite. 15' below edge of bluff where rock is cut away to form a drainage ditch for the road, we took the filled *Leptaena*.

Salona

20'

{ 8 1/2' to road.
CalcareniteFilled *Leptaena*

16 1/2'

Calcarenite

3'

mealy zone

Filled *Leptaena*

Hackly fracturing dark; blue black ls

88'

Stream at base of bluff

(15)

About 50 yards downhill toward Onondaga intersection Salona with one (or 2) bentonites is exposed and just on the nose of the hill is a small quarry showing Salona over massive Rodman. The latter here is a mass of detrital material with many bryozoa. Some 30' below Salona in calcarenite occurs fossil *Leptaena*. We think the Rodman Salona contact is probably only about 5' above base of Onondaga in which case the bentonite is from the Salona. Actually the shaly weathering rock on west side passes into the smoothly jointed Rodman hump. The Salona-Rodman contact I would say is about 5' above floor.

Breakfast	0.85
Lunch	0.69
Supper	1.70
Hotel Bellefonte 2 nights	6.00
Gas Jersey shore 10 gals.	2.70

85
69
170
324

(16)

October 8

Section at Salona according to Kay

Nealmont 90'
 Valentine 10'
 Valley View 65'
 Stover 90'
 Snyder 70'

Salona qtz - Southwest side of quarry evidently in Snyder but the rock is highly siliceous from weathering and with a rough gritty surface. It has none of the lithology of the Snyder. It also contains very dark. It suggests Boston lithology.

These are overlain by dark massive rocks presumably Stover of Kay. On west side of quarry are light gray weathering bedded ls with wavy bedding and some shaly partings. This would be in position of Valley View.

At the extreme west end of the quarry is a calcilutite (Masham-like) band, probably the Valentine.

Above this is the Nealmont forming most of the NW wall. The mottled and banded Nealmont occurs in the lower part but the upper 30' are a coarse calcarenite in thick beds except for some shaly layers. At the west end of the quarry by the RR tracks the calcarenite of Rodman is contact with the Salona at about the edge of the wall. 15' below the Salona in a shaly bed occurs the fossil Leptaena.

0794

(17)

October 8

Breakfast

0.85

Supper

1.10

Lunch

0.10

October 9

Breakfast

0.55

Lunch

0.50

Supper

2.00

Bald Endicott

3.47

Hotel, Lock Haven, 2 nights

7.00

Oct. 10

Breakfast

0.65

Lunch

0.58

Hotel, Hamilton, N.Y.

3.25

Gas, 10 gals. Towerville

2.94

Supper

1.35

1.43

123

(18)

October 10 Roaring Brook Young sec 44

Pamelia - Pre E contact just on upstream side of RR at Roaring Brook.

Pamelia - Lowville Contact at base of 2nd falls.

Top of Lowville just below top of 2nd falls.

Top Chautauque at top of 3rd low falls.

Chautauque blackish, cobbly weathering ls. suggestive of Graciosa. Flecoid markings of lower bed suggest Graciosa. Top Chautauque also cherty and with Stromatopora, Tentaculophylloids and Columnaria. Chautauque fracture shows almost black rock.

For Black River detailed section see Young Sec. 44.

(19)

October 11 -
 Breakfast
 Car service
 Supper

0.70
 1.45
 1.60

Visited House Creek to collect
 Rockland. Saw Rockland, Hyll and
 Sherman Fall. Then went to
 Roaring brook to see Sherman Fall.
 The Cryptolithus bed is at the brink of
 the second falls in the Park.

Went to see Cobourg in the village
 of Martinsburg.

In Louville where Hy 12+12D cross
 Mill Creek, just under bridge on
 downstream side is contact of 13+
 of Chaumont with 13'+ of Selby. This
 is a hard platy limestone in layers
 about 8" thick. This distinguishes
 the members from the massive
 Chaumont. The Selby is cherty but
 not so much so as the Chaumont.
 The Nappanee is thin-bedded and
 shaly limestone abounding in
 Dalmanella, massive bryozoa
 and Eozygia with occasional
 Zephrosia extans and Eurybyella.
 The beds are exposed between the
 two bridges behind the houses.

0797

N. State + River St.

(20)

October 12 —

Breakfast

0.40

Lunch

0.60

Supper

1.40

Gas, 11.9 gals., Binghamton, N.Y.

~~3.39~~

Hotel, Torrville 2 nights

~~4.00~~

Collected at gorge of Sugar River where it flows under N.Y. Hy. 12. Lower part of gorge in Napanee member of the Rockland. Higher Napanee and Hull appear in a road cut just south of the river. Made Sunbury at 5:20 P.M.

October 13.

Breakfast

0.75

Room Sunbury

~~3.00~~

Lunch

0.46

Supper

1.90

Gas Lewis town

~~3.50~~

Bethlehem Steel Co., Cy. - Naguery No 1.
Quarry at Naguery trending N-S.

On west side of quarry is a rim formed mostly of dark gray ls. weathering ash gray to white with ls. breccia common. (Howard N and Stover lithology appears followed by beds of light gray fracturing limestone filled with ls. breccia. On the north rim on the west side Stover pitted lithology appears and the rock fractures fine granular and lighter in color than the lower Snyder-like beds. The Stover lithology is followed by

Napanee just west of bridge at junction of North State and River Streets.

Hammo-beatrica in block of Snyder-like emb. Lower bed very white weathering

(21)

fine granular limestone with prominent *Stromatocerium*. On this appears a 5' band of mealy weathering shaly ls. containing *Zygospira*, *Pseudodema*, *Strophomena*. The 3-5' above the mealy band has *Lambeophyllum* c.

The rocks from the mealy band up are darker in fracture & are mottled and often irregularly pitted thus suggesting Nealmont. The Nealmont is very massive grayish black limestone with some crinoidal debris.

About 5-10' of Salonia overlies the Nealmont. It is cobbly, black ls. weathering yellowish gray. It strongly suggests Edinburg (Happ Hill) lithology.

Q₁ 1/4 mi. SE of Naginay No. 1.

(2)

South face shows 15' of massive conchoidally fracturing silicious ls. that reminds me of Hatter. This is followed by 15' of white weathering pure ls. containing ls. breccia. To the east along the quarry face the beds steepen to the east wall where they are very steep. The east wall is composed of steeply dipping massive ls. with worm-eaten surface like Stover. We estimate about 35'. The NE face of the quarry butts the east face in a fault. The NE face is mottled Nealmont with *Doleroides* in a shaly zone.

(22)

(4)

Quarry 4 just SE of Honey Creek on NW wall has dark gray ash-weathering limestone in heavy ledges and separated by beds of thin platy blue shale about 3 or 4 shale beds in all. This limestone + shale occupies about the lowest 50' of the quarry are in these beds.

The next 65' of rock are difficult of definition but in it are black fracturing light gray weathering with wavy streaks. The lithology is very suggestive of Nealmont. The ledges are quite thick when fresh. I see nothing absolutely typical of Nealmont.

(of the 65')

The upper bed is a 3-4' band of conchoidally fracturing siliceous ls. reminiscent of Horner

Above the 65' comes about 20' with Stover-like lithology, irregular short horizontal pits. I cannot be sure if this is Stover or Nealmont because they look similar. On this Stover-like material comes 2-3' of mealy ls with *Glyptotheca* and *Pionodema*, the same as the mealy band in Haginay No. 1. Above the mealy bed are 125' of Nealmont-like rock.

Fine-ribbed *Ancistrorhynchia* was seen in the rock of the 65' interval.

The shaly beds are interbedded with dense ribbon-banded limestone weathering brownish gray and having a conchoidal fracture. Near the entrance to the quarry where the section begins the rock seems dolomitic. This division suggests the Loysburg but it may as well be Canadian.

23

October 14

~~Breakfast~~

0.60

Hotel Lewistown & garage

3.75

Lunch

0.50

Supper

1.70

11'

Dolomite

MB

Quarry 1.8 mi S54°E of Orbisonia
Craig section 2. MB = metabentonite

48'

A

A - very dark Trenton-like fracturing
ls., crinkly-bedded weathering blue gray.
The 1 1/2' below the bentonite has the same
blue gray weathering. The top 30' contain
Opitina, Doleroidea, Hesperorthis, Strophomena

10'

B

MB

15'

C

B - ca. 10' heavy-bedded dull gray weathering
crinkly mottled ls like characteristic
Nealmont. A+B = Rodman - Centre Hall.

11-15'

D

10'

E

C = same as B

40'

F

D. shaly-weathering with two mealy bands
seems more shaly than AB which is
unlike Oak Hall of type section. Fossils
abundant but poor. Small Sowerbyella c,
Hesperorthis c, Opitina, Nidulites-like fossils

33'

G

E+F = Snyder

E about 10' of mottled crinkly bedded
ls blue gray weathering which I would
call Nealmont.

14'

H

14'

I

G - Hostler - Mostly black fracturing
ls, very fine grained, heavy-bedded
with uneven surface between bands.
Upper 6-7' drab-brownish gray weathering
cross-sections suggesting Anistosthenia
Girvanella, Stromatolites
Girvanella bed separated by thin shale
with Campylothis?

40+

J

(24)

H - 14' of Brazier, heavy- bedded streaky mottled surface weathering into rough yellow & blue gray plates!

I - Clover mottle & worm-bored, nearly black fracturing limestone, many sections of snails.

J. 40' + heavy-bedded, yellow gray weathering; finely banded limestone with conchoidal fracture. Contains a thick 1' bed of shale and a dove (calcutyte band) This division is like that at base of Ay 4 at Naginey. It is quite definitely The Logsbury!

Quarry 0.8 mi S 5° E of Spring Run.

Orange { Like the Mercersburg in lithology

Mercersburg { Wavy bedded, blackish ls. breaking into ragged lumps, the shaly surfaces weathering yellow. *Opikina*, *Hesperorthis*.

20' Dogfishburg - calcutyte

28' Fairmountsburg { Black, mottled, weathering dull dark gray with yellow surfaces. *Solenopora* and *Stromatoceras*

20' Pineburg { Black, hard massive, wavy mottled Brazier lithology

Any of the beds described could produce Edinburg - Chambersburg lithology.

(25)

October 15 - Visited section 2 1/2 miles SW of Majors. I was impressed by the Nealmontian character of all the beds above the cobbly layer. In the section at Wilson, Md. The Stover-like lithology of the top 50' of the Pinesburg is very striking.

Breakfast	0.80
Lunch	0.50
Gas, Hagerstown, 10 gals.	2.86
Hotel, Chambersburg, Pa	2.00

April 19, 1951

Ap 19¹ 5.1 mi southwest Kimmel Spgs.
in hand lining ss. D. most like
D. transviana of Billard.

Ap. 19² - Bosses of cobbly ls. having
Up. Lenoir lithology. Contains sponges
suggesting Lenoir or Beuloh.
S.S. #4 near base on road 0.75
miles SW of Low Chapel, Blockhouse
□, Tenn.

Ap 19³

BM LHT 1366

Intersection at BM 1366 - 4th
Series shale. Rd intersection
Blockhouse □, Tenn. Soft pinky
shale with *Cyrtotella*, *Panorthis*,
Richardia, suggests Mazon or possibly
lower. Came at Chilhowee View
school turned SW to pass Moshannon
& Lenoir on south side road, Knox
on N side for about 1/2 mile SW of
shad.

Ap 19⁴ Blockhouse - 20' of
cobbly & shaly ls. about 200 yds
long, parallel to road. Overlain
by black shale. Contains
Leptellina & m. gen. like *Sowerbyites*.

Neuman's ss #4 in Keith's
ss lentil in Series

Ap 19⁵ Shale #6. Bend of road
0.55 mi about 1/2 mile WNW of Butterfly
Gap, on Mook Creek. Blockhouse □
with abundant *Sowerbyites*.

Send Bob Raymond + Willard
Cambrian papers for Bob + Phil.

Apr. 19⁶ Mook Creek, lower Bays
with coarse ss and about 2 mm
west of house just NW of C in Mook Cr.

Apr. 19⁷ - 150' under Bays, 1.1 mi
SW of Law Chapel. ss with
Dolomites.

Apr. 19⁸ - SS#4 with cobbly ls. &
marble like Apr. 19².

Apr. 19⁹ Spicewood Branch,
SS#3, 1.45 miles WSW of Rocky
Branch, Purley ss with *Strophomena*
of *Tennesseeensis* type.

75
742.1

3.1

April 20-21

Halls X-roads - turn right at light on turn 131. Turn right on Browns Gap road. 'Benton' at junction with Browns Gap road + main road. Witten in field on south side of road. On Bell road Bentonite near top of Moccasin Reservoir about 50-100' above the Bentonite. Lowest of 3 big bentonites.

Bob reports lower tip of S curve just past Kays Chapel. On end of S side of S.

Bentolt fossils with abundant Fascioides 200' S of Racoon Valley road on US 25W

Just below beds with Tetradium on north crest of hill just N of Elgin Gate of Oak Ridge project Clinton Co. Probably Bentonite. The Tetradium beds are the Bentolt

Wardell Protolynch. NE of gate just above Glyptothus. Hedgeworth 1/4 mi. NE of gate. The Rye Cove Wardell with Glyptothus. Racoon Valley rd. at a road junction just over Clinch R and L & N railroad about 1/8 mile. Clinton about, 3.1 miles west of 25W

8.3

April 22

Newman 143A

Apr. 22 Kusick Spr. [], old Tenn
73, NW side Little River, 0.3 mile
ESE of Walker Chapel, in ravine
about 100 yds S of road. Sowerbyites
in ss (either #5 or preferably
unidentified horizon SE of Quess
Creek. On road about 50 yds east
of creek in shaly rock are large
Dinorthis.

Apr. 22' - Road cut with purple
ss. Having large coarse ribbed
Dinorthis, Rhynchonella and
Mimella. This is ss #3 or shale
#4.

Type Tullis = ss 1 through ss 3.

Bimuria locality had also Cyrtostella
1.3 miles ENF of Kusick. Bimuria
are in shale #4.

Sowerbyites beds on Chapman
highway are also shale #4.

9.6
8.25

0807

Apr. 23

Lenoir Small gy. on ridge road
1.3 miles S ~~mile~~ of junction
of US 411 & Tenn 71. Ridge road
goes S from junction. Clin
Bevierville

Loc 1.58 miles ENE of Kussack
Heavy-bedded cleaved ss with
lower brachiopods, *Dalmanites* or large
orthid, *Septellina*, *Oxoplesia*,
Multicostella, *Lingula*, *Echinozaphrentis*,
Rhipidomena

Boyd's Creek School - a layer of
shaly ls. between Lenoir with
Valcouria & *M. Nucula* and
the Effusa beds with *Arturocrinus*.
This could be the *Lencolinaria*
horizon.

Tennessee - Alabama

October 14 - 26.

1951

$$\begin{array}{r}
 30 \overline{) 460} \\
 \underline{30} \\
 16 \\
 \underline{14} \\
 2
 \end{array}$$

70

$$\begin{array}{r}
 \overline{) 982} \\
 \underline{70} \\
 282
 \end{array}$$

$$\begin{array}{r}
 282 \\
 \underline{280} \\
 2
 \end{array}$$

$$\begin{array}{r}
 275 \\
 \underline{19} \\
 85 \\
 \underline{76} \\
 9
 \end{array}
 \quad (145)$$

①

Oct. 15

Bethel Valley Sheet,
Section at B M 1572

Yellow cherts with pinnuloids on NE side of section, contains interbedded green shale, this chert ca. 200' thick. It suggests Ward Cove because of *Trinipora*.

Under the W.C. chert occurs 125' gray or greenish shale, very thin-bedded. Toward the bottom the shales are bluish. Under these shales are red-beds of Hogskin Red beds = 125' Under the reds are 75' of Elway Chert. Under the Elway 60-50' of yellow shale & red bedded Knox contact comes just south of sharp bend of road about 1/4 mile N of intersection.

On south side road about 25' nodular brown fossiliferous ls. Then comes cobbly ls with large *Murchisonia*, *Opikina*.

Moccasin at top of section about 0.25 mile south of intersection at end of hairpin.

About 0.1 mile to base of Moccasin from intersection. The *Dunorthis* transversa bed is under the road. Little or no Wardell, probably replaced by Moccasin.

②

Oct. 15 $\frac{1}{4}$ mi N of Elza Church - about
125' of whitish ls & dolomite below
cloudy. 15' of red beds at base of
whitish beds.

Bethel Valley \square about $1\frac{1}{2}$ mi E of
East Fork Valley, road just N^E of
of XL Springs. Road through Gum
Hollow Branch. XL Spring comes
out of the Knox. On NW side
of Turnpike Knox chert on
top like Blackford sh. & chert
on slope. Contact about 100 yds
N of road. Ridge on south side
road is Elway. Blackford mostly
dark gray clay. Borens about
0.2 mile S of intersection.

Cryptophagnum about $\frac{1}{4}$ mi S of
intersection. Another Cryptophagnum
seen about 0.3 mi S of intersection.
First reds about 0.45 mi S of
intersection. These are Miller's
Ben Hur according to BNC.
About 0.5 mi S of the intersection
comes residual soil with large
Zygospira showing we are well
up in Fenton. This is at turn-
off to Country Club (Oak Ridge)

Dip 30° Strike ca N50 E
Wardell-Bentolt seems to be
faulted out of this section.

(3)

0.4 mile S of intersection just
W. of Eliza Cove. This is
Hardy Creek of Miller which is
the fossil bed at top of Hagan.
Here we saw *Ancistrorhynchus*,

The *Rhynchotia* here suggests
Hermitage or higher.

The Hardy Creek locality is opposite
a side road from the west.

Ben Hur mud rock is opposite side
road. This contains large coarse-
ribbed *Zygospira*.

④

October 16 - Big Ridge Park □
 Section starts on N side of inlet
 about 1 1/2" south of NW corner of □.
 On north side inlet excellent
 exposures of Knox this is
 overlain by red beds & dolomite
 of Blackford faces at water's edge
 on N side of inlet.
 N 28° E 15° SE

- ① Blackford, red beds, dolomite
 massive, cgl. with red chert
 and ragged blocks at base.
- ② Lowville-type rock in beds up
 to 15" thick. Tetradium syringopora
 abundant, Hirvanella, some silty
 yellow layers, red mottled layer
 below middle, smooth ostracods.
 This interval culminates in a red-bed
- ③ Massive ls full of Tetradium
 and Anisotrypa
- ④ Covered
- ⑤ Massive mealy fracturing ls.
 making a ledge 120' thick
- ⑥ Ls with black chert, thinner
 bedded than below. Black in
 fracture. Some silicified snails
 Helicotoma X section

- ⑤ ⑦ Massive, dove bed about 15' thick
- ⑧ Cherty (black, blocky chert) but limestone rather light gray. Thin bedded. Tetradium abundant. Brownish gray color. This is Miller's Pottsville. No chert except at bottom. Top of interval has another Anisotrypa. Tetradium abundant in thin wealy beds, suggests Hagan cut.
- ⑨ Tetradium beds. probably *T. cellulorum*.
- ⑩ Cherty gray ls. A few feet only. Big *Leperditia*, *Anisotrypa*.
- ⑪ Thick dove bed.
- ⑫ Dove & wealy Tetradium ls.
- ⑬ Reddish silty bed a few feet thick.
- ⑭ Thin-bedded ls to *Hesperothiris* & *Stromatoceras*.

Cryptophagus - east side of
Jacksboro W of US 25W. 1/4 mi
NE of Jacksboro

⑥

Loose below Stromatocrium we found a loose piece with Cryptophragmus. This was in a position I feel confident was not far from in place.

In the Witten the Cryptophragmus spanned fully 200 feet of rock. The full thickness of the Witten is some over 200' and the Cryptophragmus occupies nearly the full thickness.

NE of Jacksonboro the dip was about vertical. Started in cherty Perry and went through same sequence as we saw at Andersonville.

The Tetradium beds between the red beds are most like New Market and are probably the equivalent of the Elway and Lincolnshire (Hogskin).

⑦

October 17 -
Left Knoxville and went over
to Rockwood. Took US 27 down
valley searching for a limestone
belt. Went to about 5 miles SW
of Dayton but saw no good
exposures.

Went over to Sequatchie Valley
and worked from Cold Spring
south to SW edge of Pikeville
Quad. No long sections seen
anywhere in Valley. Saw two
short sections of Witten with
Cryptolagus common, one on W
side Valley $2\frac{1}{2}$ miles SW of Pikeville
and the other on the east side
 $2\frac{3}{4}$ miles almost due south of
Pikeville.

⑧

Oct. 18.

Base of Cedar Ridge, SE of Litton
Sagadahoc Valley.

A - ca 8' white crusted dove ls with
streak of *Tetradium*, *Bathymus*
and coarse-ribbed *Anostrothya*
Looks identical to Perry just above
red-bed in Andersonville section.
Thick black shent. Exposed on
both sides intersection.

P

Bentonite

N

B. massive somewhat impure ls.
very dark gray with big *Lepiditina*

16' M

C. shaly ls. 2'

16' L

D dark gray earthy weathering
massive 12'-3' in 2 layers.

85' K

E 5-6' shaly mud-cracked ls.

F 3' hard, dark brown-gray ls. with
Dystactospongia, *T. syringopora* &
Anostrothya.

50' J

4' I

4' H

G. Thin-bedded, dark brown gray ls.

12' G

3' F

5-6' E

2-3' D

2' C

6' B

8' A

Covered

⑨

H - Same as below but with
Hebertotthis, Opikina, Anisotrypa
opposite house

I. Camarocladia beds 4'

J. 2-3' heavy ledge with
Opikina 6', Anisotrypa
Camerella. Small amount of
chert

K - about 60' of thin bedded Camarocladia
parting ls. with.

Lebanon L - 35' dolyl mudstone, limy interbeds
Carters { 3' massive ls. with *T. radiata*
15' dove gray slabby calcareous

M - Calcareous 16'

N - Cherty ls. with many fossils
mostly covered. *T. cellulosa*
near top = Carters?

O. Bentonite

P Slabby mud-cracked bluish
earthy ls.

(10)

October 18.

Section on base of Cedar Ridge Pikeville □, section started at road intersection and headed toward Tow Gap. The lowest rock is like that of low Perry just above red beds in Andersonville section. *Ancistro-rhyncha* present in all lower rocks but hard to get. Fossils occurred again near top of massive ls. Here also some *Glyptothorax* like *G. assimilis*. Then a little higher come *Hesperorthus* + *Opikina* like the high Wardell. This is also like high Ridley.

Above the Wardell-Ridley come *Comarochadia* beds and about 60' above base *Pionodema* and other Lebanon fossils. A calcarenite occurs some distance above the *Comarochadia* beds + has *Sowerbyella*, *Doleroides* + *Campylorthis*. I think this is all high Lebanon. Above the granular bed the section is mostly covered but bluish ls contain *T. cellulosum* and *Lichenaria*. This is undoubtedly the Carters. Then comes a Bentonite followed by earthy limy layers.

At junction Tennessee 8 + 28
just SE of Dunlap are high
beds of our section with Bentonites.
Between bentonites are chalky -
weathering limestones with
fairly large cup corals. This
reminds me of the large
quarry in Chattanooga.

(11)

October 19 - Saw section on West Chickamunga Creek. As nearly as we could determine the base of the beds on the creek are just about the base of the Murfreesboro. I think that the creek may have cut down on the contact.

Taking the right fork of the road there is an exposure of Beulvot-like rock at the top of a low hill. This overlies a thick yellow shale and it underlies *Hesperornis* beds we think are Wardell.

The quarry $1\frac{1}{2}$ S of Cove Church seems to be in Wardell and lower Lebanon. The combination of species suggest Wardell rather than high Lebanon.

The *Hesperornis* beds north of Rock Spring must be in the Wardell also. The Ridley Run would include most of the shaly beds above the *Maclurea* ls.

The big cut on the north bank of Chickamunga Creek on US 27 is same Beulvot-like bed as that seen this morning.

October 20.

Left Trumville for Attalla. Saw section just SE about 200 yards from Big Wills Creek on U.S. 241.

Lower beds are cherty with rounded small masses of chert.

According to B. N. C. this is like the Hardy Creek of Miller.

These are A in the section. The ls. is dove, brownish gray

B - 29' to calcarenite with

Rosticellula

C - Upper 6' shaly ls. with

Sowerbyella and *O. pilina*

D - Drab shale with ls. cobbles.

E - 2nd *Sowerbyella* zone
Shaly ls.

F. Calcarenite with *Stromatocrinus*

G. 2' with *Camerocladia*

H. Brachiopod *brucina*

I. Crumbly ls. with *Campylorthis*

J. Earthy clastics with
Dystactospergia

K. Calcarenite with *Sowerbyella*

12

New York

3'

K

3 1/2'

J

Campylorthis

I

5'

H

2'

G

5 1/2'

F

Sowerbyella

E

12'

Drab-yellow shale

D

Sowerbyella

C

Rosticellula

29'

B.

33'

cherty

Hardy Creek

A

(13)

October 21. Left Dalton about 8:30 AM and went through gap just NE of city. Here saw red beds said to be Moccasin-Lowville. The beds however are very coarse and sandy and are rather massive. They were suggestive of Sequatchie rather than Moccasin.

Followed Georgia 201 over to Villanow. East of Villanow about 2 miles saw some red beds but no good section.

Went west of Villanow on Georgia 143 (marked 2 on Catlett sheet). About 2 miles W of Villanow saw long section in Silurian capped by Chattanooga shale. Still further west through Maddox Gap is another long section extending down to the junction of Ga 2 (143) and Georgia by. 95. At the junction occur red and yellowish mudrock, thought by BNC to be Blackford. For about 0.4 mile east in the field are in succession dove ls. followed by yellow shales with thin limy bands with *Sowerbyella* and *Piondema*. Above these are yellowish Moccasin mudrock, possibly 275' in all. Up the hill are Sequatchie red beds.

Specimens in
Ottawa Canada

September 22.

Spent entire day at Crown Point. On east shore Bulwagga Bay section is exposed at South end of the Bay. Lowest rock exposed is the upper part of the Fort Cassin limestone, A1 of Raymond's section A.

This is overlain by 12' of shale dark gray in color, and containing beds of hard limestone up to 6" in thickness. One of these 6' from the base contains Lugula brainerdi in abundance. A2 of Raymond

These shales are followed by about 40 feet of dark gray limestone. Fossils are common above the lower 5'.

Raymond's section B. is mostly from the new bridge west along the shore to a point just beyond the old French fort. Here was taken Duplexia gracilis.

The upper beds of the Chazy are in the fort grounds, a heavy 2' bed of coarse ss.

Borrow Obolus affinis from
Redpath

Ostrea band 3

Camarotoechia plena from
Montreal.

Pionodonta subaequalis Montreal

Cam. varians Montreal

Drivertia platys

Albany R. Dev.

Types from Coughnawaga, La. Pierre
Os., One. 2 views

H. vulgaris Raymond *

Camarella longirostris 1039

Has dental plates + suggest 3
small *Triplexia*. Beak of ventral
valve of type is broken. Strong
dorsal fold at very front of valve
Mingan slds.

Camarella varians

Type lot of 2 specimens, 1038 is
a wide one, 1038a is a narrow one.
Wide one has flaring flanges +
3 ribs in sulcus, 4 on fold. Sinus
originates at middle of valve
Narrow one has 2 ribs in sinus
with narrow folds bounding sinus
Mingan slds.

Stroph. imbecilis

Good ventral 5596

" dorsal 559

881 *Remopleurides affinis* Bill. with
Leptella.

H. intermedia for Dr. Kindle

Obolus belli Bill.

Island of Montreal, Que.

1026 b is ventral, 1026 c is dorsal.

Large globose in shape, beak
near a L? 2 views

Lingula lyelli 1027c

Plumette d.d., Pontiac Co., Ottawa R.

Very elongate distorted & wrinkled

L. 55, W. 27; 1027 = L. 37, W. 23 2 views

Dimorphis platys Bill.

d.d. of Montreal, Que.

1034 a = 44 W, 35 long

Sinate in front $\frac{1}{3}$ of ventral
valve; subcarinate umbil.; dorsal
sinus ~~to center~~ in posterior $\frac{2}{3}$

5 ribs at front in 5 red lines 3 views

Hebertella imperator

2 views

1036 - Ventral interior

1036a - Dorsal

"

& side view

Hawkesbury; Ont.

C. plena Bill

Montreal, Que. 1040

L. 37, W. 32

6 ribs in sinus, one on each slope
of sinus; 5 on flanks, W. of sinus 26

Dorsal, 4 on flanks 6 on fold; a
subdorsal rib on slopes from fold. Ribs

all strongly angulated

4 views

Camerofoveschia orientalis

Mingau Islands

Small, 3 ribs in deep sinus, strong 4 ribs, 4 ribs on flanks. L. 16, W 16 figure 1041 F. 3 views

Several specimens with 4 ribs in sinus, + 5 on flanks. May be another species

1041 a, b, d, R, 1041

Specimens with 4 ribs are wider than those with 3 + have a more convex dorsal valve, select 1041 b for type L 16, W 19

Flanks of 4 ribs in sinus very flaring, sides apical \angle obtuse, one with 3 ribs is acute. Beak of 3 ribs more acute. 4 views each.

Hebertella borealis 1035 C

Type specimen, broken, dorsal side strongly convex, sinuate to margin, strong ribbed. 5 in 10 at front. Apical line, narrow delthyrium. Cardinal extremities deflected strongly dorsally. Dorsal lateral slopes very steep towards the cardinal extremities. Ventral valve flattened with very gentle lateral slopes. Type L 35, W 42! Ribs become very fine on flanks. 38 ribs on ventral side of type

A large specimen 1035 a suggests *H. imperator*. It is L. 44, W 50

Red scale

Clitambonites porcia.

1044

W. 18, L. 11.

Small, multicostellate, finely imbricate lateral margins gently rounded, card. Ls obtuse. Clavate area orthocline, delthyrium very narrow. This is almost certainly a small Glyptothus. It is associated on same slab with a small *Pseudodema*-like brach + a big Cystid.

Chazy, Island of Montreal.

2 pictures

Strophomena canadensis Wilson

W 34, L. 27. Swollen in middle, 6220 rounded cardinal extremities, rounded anterior and lateral margins. Sinuate umbo and to middle of shell.

1st terrace above house on rd. 2 pict.
MacLean Landing, 30 mi. above Ottawa.

Orthis acuminata Bdl

1045

Fragment of dorsal extension with low cardinal process
La Prairie, Que.

1 picture

Lingula lunonensis Bill. 1028

Near L'Orignal, Clarence Tp. lot 16, or 10.
Con. 1? Russel Co., Ont.

Swollen in middle + with low elevation in middle. Ventral valve

1 picture

Pictures taken
Eichwaldia subtrigonalis interior
1145 d; type 1145a (small whole)

Dinobolus magnificus interior
11616

D. canadensis type 1150.

McLennan Exchange

Camerella parva Bill suggests
Cyclops pira or *Leptocera*, etc.
not at Camerella

D

Types in M.C.Z

Palaeoglossa belli - MCZ 8722 - consists of 3 specimens; 1 ventral, 2 dorsals one of which is not recognizable. Ventral valve lacks apex of beak. Length 20.8 mm; width at widest part about in middle is 16 mm. Surface with concentric, to rounded lines separated by finer wavy lines.

Dorsal valve incomplete at beak, and shows scarcely any ornament. Casts taken. Ross Republic Co. 3 mi. SE of Knoxville, Tenn. Holston, hard sparsely granular light gray marble. This is probably a new species.

Palaeoglossa gibbosa - 8587, Murat, Lexington, Va. Hard, light gray, semicrystalline to crystalline ls. Length 26.5 mm, width about $\frac{2}{3}$ from beak 25 mm. Seems to be a dorsal valve. It has median septum. Consequently the species is probably an *Echiroldia* as I thought.

Schizambon cuneatus - 8588.

Length 15 mm., Width slightly anterior to middle 13 mm. Holston, ~~dark~~ light gray semigranular ls. Concentric lamellae with double line on edge. Spines very fine about 2.5 mm. Long

McNutt Qy, Sharon Springs.

Conotreta declivis - M.C. Z. 8593 In ^{mottled} pinkish granular marble containing *Ptychoglyptus*, *Cyrtototella* & called Holston, McNutt Quarry, Sharon Spr. Height of cone 2.5 mm, width at base 3 mm. Ornament only slightly preserved consists of fine, even concentric lines.

Acrosaccus shuleri - 8591 McNutt Qy. 2 specimens, 1 ventral, 1 dorsal in gray + pink granular marble called Holston. Dorsal valve small with submarginal but fairly strongly elevated apex.

Ventral valve conical with apex partially broken away showing a tiny hole for the pedicle which must have emerged at or slightly posterior to the apex.

Aerostacus punneus - 8592
granular to semi-granular pink
and gray ls. Shell is large
exfoliated from the inside

Petrocrania prona - 8589 = n. sp.

Base of O Hove, by N of Luttrell, Tenn

Length 15.5 mm; width at middle 14.5
Thick shelled, stout forming a very
low cone about 4 mm high. Apex
not preserved, apparently located
about $\frac{2}{5}$ the length from the posterior
margin. posterior ^{or shorter} slope gently convex
with moderate slope, anterior slope
gentle and very gently convex.

Posterior scars very large, close
together. Behind them two
oblique ridges extend towards
each other but do not unite
Anterior scars smaller, not well
defined, indistinct. Surface marked
by horizontal growth lines only.

Aparatypa

Petrocrania acicula - 8590
O'Horee (base) Qys. N. of Luttrell, Tenn.
Very convex, sulcate anteriorly.
Median muscles (Posterior?) large.
No muscles seen at anterior
margin on opposite sides of
ridge produced by the sulcus.

Orthis disparilis - 8594, O'Horee;
Liberty Hill, Tenn. Same as my
H. australis.

Plectrothis holderi - 8595 - a flat
plate of dark gray chert weathered
brownish on upper surface
showing a number of small dimorthis.
Called *Holston* at Geers Ferry
but seems probably more likely to
be *Lenoir* as it is chert. Specimen
a small ventral valve with 27 costae
swollen umbonal region. Suggests
the small Sinkin Creek specimens
or some of the smaller silicified
Dimorthis from the O'Horee.

Hebertella melonica 8596
O'Hosee (Lower 30'), Fugates Hill
Large, subquadrate, Length 25.3 mm;
width 30 mm. 9 ribs in 15 mm at very
front. Ventral beak protrudes beyond
dorsal. Ant. commissure faintly
& broadly implicate. No dorsal sulcus.
Ventral sulcus shallow. This is of
large size.

Glyptorthis - *my virginica* but small
O'Hosee at Liberty Hill. Best specimen
8.3 long, 10.5 wide, 5 mm. thick. Strongly
opacine interior, and very convex
ventral valve. Dorsal valve only moderately
convex.

Dalmanella rogata - O'Hosee at Liberty
Hill. These are the *Pionodema* with
dalmanelloid appearance. L = 17 mm,
width 12.5, thickness 4.5 mm.
Ventral beak extends above dorsal,
beak very prominent. Dorsal valve
only slightly convex. I have some
from high O'Hosee. They look like a
robust *D. rogata*.

Placsiomys platys - 8598 - Otter
Species Ferry. Very large ventral
length 26 mm., width 33 mm.
Thickness 7 mm. Sides subparallel
front broadly rounded. Cardinal
extremities a right \angle but deflected
dorsally with deep grooves. Beak
prominent. Dorsal beak extending
slightly posterior to ventral. Ventral
valve very slightly concave at front
half. Ribs varying from 9-12 in
5 mm. at front on same specimen.
In 5 mm at 18 mm anterior to beak
are 12 costellae. This specimen is
a large specimen of *P. brevis*.
Same is probably true of the interior.
These may differ from the large
coarse-ribbed ones from Rye Cove, as
described.

Placsiomys brevis - 9 specimens
Cotypes 8600 - Larger 17.5 long, 24 wide
Cardinal extremities deflected. Ventral
valve slightly concave in front
Sulcus shallow extending from
beak to front margin. 13 costellae
in 5 mm at antero-lateral
margin of dorsal valve. Swollen
ribs not numerous. Otter Species
Hill.

Placsiomys elongata - length 20 mm.
width 12.5, thickness 11 mm.
Hinge 20.5 mm. 11-13 costellae in
5 mm. at front. Squarish, very
thick, ventral sinuate, flatly
convex on flanks. Dorsal rather
strongly convex. Anterior area long,
apiculate (strongly) Dorsal interarea
curved apiculate.

Dinorthis atavoides 8605 - Holston
N of Copper Creek on RR between
Speers, Ferry & Clinchport. The
specimen is large with no
intercalated or bifurcated costae.
The median portion of the ventral
valve is swollen, the front depressed.
The postero-lateral regions are depressed.
The specimen looks like the large
Dinorthis called Lenoir by Butts.
Ventral muscles large. Matrix
of interior is dark gray nodular
evidently from shale.

Daiuorthis quadruplicata 8602

Otosee, Fugates Hill

Length 19 mm. Width 24.2, hinge 17 mm

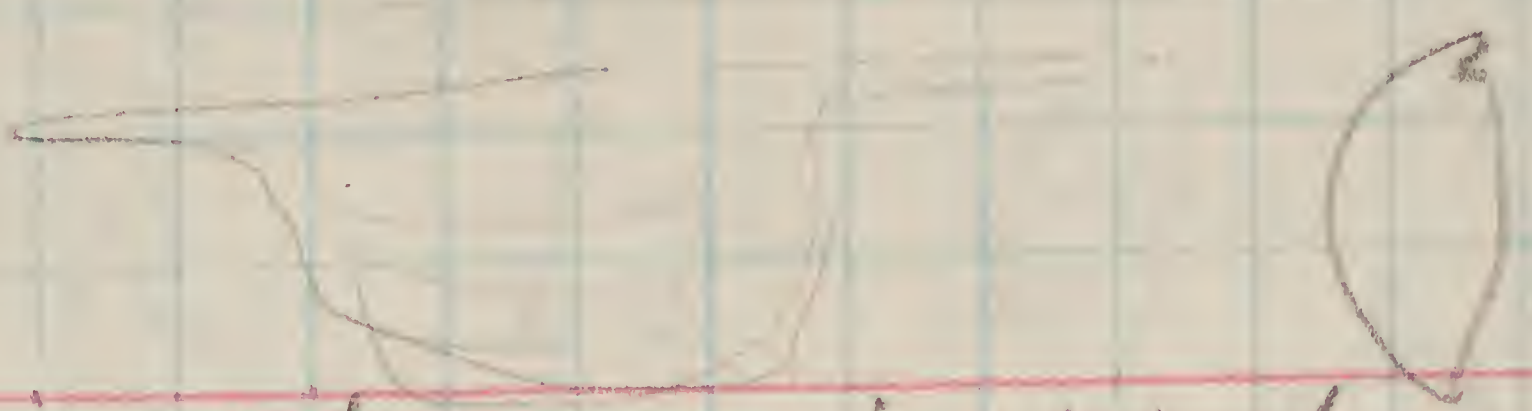
Subquadrately rounded extremities
4 or more stronger divided or
undivided ribs in central part
I have many of these. On the
holotype there is practically
no sinus on the dorsal valve.

D. transversa - Holotype. 8603 - Very
wide, completely unlike *D.*
quadruplicata and a good species
Length 19.5, width 29.5, hinge 21.5
Besides its width this species
differs from *D. quadruplicata* by
its deep dorsal sulcus. 2 paratypes

Pionodema globosa is truly a
Mimella. Holotype 8609
Length 19 mm., Width 21.5 mm., Hinge
13 mm., Thickness 10 mm. May be
young of *Melonica*. V.-Convex in posterior
half, flattened anterior half, Cardinal
spines deflected dorsally. 12
costellae in 5 mm at front of
middle of ventral valve.

Paratype - definitely ventral valve
of *Mimella*. 12 costellae in 5 mm.
Although *P. globosa* suggests
M. melonica the ribbing is
somewhat finer.

Pionodema minuscula - 8610 -
Lebanon, Lebanon, Tenn. Small
Length 12.5 mm, width 13.5, Thickness
6.5 mm. Hinge 9 mm. Specimen
looks like miniature *P. subaequata*.
V.-moderately convex in profile, sulcate in
anterior 1/4. Sulcus narrow shallow.
Ant. commissure faintly uniplicate. Dorsal
about as convex as the ventral 20 in 5
mm. at front. Greatest width at
middle.



Plectambonites aequistriatus - 8611
O'Hare, Liberty Hill, Tennessee
~~Liberty Hill~~ 10mm. in length, 13.5 wide
Hinge 13+

Dorsal valve gently concave, pulcate medially, very finely ribbed. Faint radial undulations

Plect. delicatulus = *Leptellina* (not *Tennesseensis* but related form in *Lenoir*).

P. triseptatus - large occurs in chert with *Dinorthis* and large *Rafinesquina*. Large specimens from Holston N of Copper Creek placed here.

P. crassus. 8616 Holston, McNeill Co.
This is probably a *Leptaena*.

Leptaena prona 8620 badly silicified from *Dinorthis* zone Near Goodwins Ferry. in chert.

L. palustris Holston, Concord Tenn.

Rafinesquina duplistriata -

From chert with *Plect. triseptatus*
at Goodwins Landing

R. grandistriata 8623 Holston
at McNutt Co. This is *Cyrtostella*
Paratype of *Micostella agilis*
is a dorsal valve of this species

Raymond dups.

Protodyncha - Ridley Cumberland City Tenn
3-15; with *Hesperorthis* east of Hanover
Tenn. 3-12;

Oxoplecia - Fugate Hill - 2-15.

Pictures of echinoids to R.T. Jackson

Cooper took from
Harvard

Carb + Dev	_____	118
Jurassic	_____	75
Cretaceous	_____	183
		<hr/> 376

0821

(14) Oct. 23 - Section on US 64
just east of Ocoee. Axis of
syncline through old house
at top of hill. Three units seen.
Section starts 1.6 miles east
of intersection of US 64 & 411.

Blue sandy shale weathering
yellow brown - Saver type

Coarse friable ss.

Athens type shale, weathered
yellow, softer than upper shale

Massive red & mottled earth
probably Newala

15

Vestal marble is same one that goes through Friendsville. Holston is in a belt to the north. Farragut appears to be synonymous with Holston as it is on the Lenoir City belt.

Section at Cisco, Georgia
 Section goes east and west of Cisco P.O. just on W side RR tracks. Section goes 0.8 mile west of US 411 and about one mile west of US 411. Strike is $N 5^{\circ} E$ and dip on the west side US 411 is 38° to the east. Dip on east side ranged from 35° to 40° . Newala exposed on top of hill 0.8 mile W of US 411. On top of Newala is a thin
 Mosheim and 10' of cobbly ls. containing *Bimuria*? Then follows dark gray, white-streaking shale with a few graptolites. Then follows an enormous sequence of yellowish or yellow brown weathering light blue arenaceous shale like the Levier. This contains at least two thick beds of massive coarse-grained brown ss. This Levier type of rock runs to about 0.1-0.15 mile east of US 411. Then comes yellow shale and reddish ss all deeply weathered, culminating in a hard ledge of red brown

(16)

sandstone terminating in a coarse conglomerate. Above the cgl. is red, thinly cleaved shale like moccasin. This is followed by yellow, thin bed shale. Then comes more red as up to the fault against the schist (Pigeon). From about 0.1-0.15 miles E of US 411 to fault is mapped as Jellico but it seems to have the character of the Bays.

East of Benton just before entering gap in Sand Hills is Newala overlain by Lenoir with large Macclintones. This is overlain by 10 or 15' of cobbly ls with *Bimuria*. Then comes shale. The shale east of Benton was determined by Ulrich as Athens. On the Arline tongue we saw *Cyrtotella*, *Leptellina* and *Orhamtonides* besides the *Bimuria*.

The Lenoir was not seen west of Cisco except for Mosheim. At Benton the Newala was followed by cgl. mudstone, yellowish in color. Then came the Lenoir which seemed to be in a swale in the Newala. About 2 mi NE on this ridge at a road intersection a greater thickness of Arline appeared.

(17)

Oct. 23.

Just over bridge E of Snow Hill School, yellowish mud-cracked mud-stone & some dove ls.

Farther along the road beside the word Mahan just east of Snow Hill come dove ls. with *Strophomena* like the Wardell one. Then more yellow mud-cracked rock.

At second house (one near road) is a red bed. South side road.

(about $\frac{1}{2}$ mi E)
Opposite first house on N side road east of Tenn 60 occurs top of section in silty yellow beds, with one red bed. This is Cane Creek according to Cooper. A chert ends section. Between 0.2 & 0.3 mile E of Tenn 60 are rather shaly beds yellow with shell beds full of *Doleroides*.

At entrance to Sag occurs beds with *Hebertella frankfortensis*.

On SE of intersection Mahan Sag road & Tenn 60. Thin bedded ls abounding in *Zygospira*.

At house about $\frac{1}{2}$ mile east of Tenn 60 a thicker chert occurs below the lower one. This sets off the Cane Creek fm. between cherts.

(18)

Went on northeast to Texas Knobs and saw same section as east of Snow Hill. Along Tenn 58 we saw the lower chert zone at the top with Hardy Creek ls under it. This limestone is light blue gray when weathered and is filled with large *Zygospira*. Saw Moccasin - Dittell type limestone all along Tenn 58 on Birchwood □ from Chert Hill Church SW is about $1\frac{1}{2}$ from the southwest corner of the □.

Went back to Snow Hill and measured section. A lower red bed occurs about 40' above the base and is sandwiched between yellowish earthy beds. A second red bed of redder mealy rock occurs higher in the section and is exposed at first house west of Tenn 60 on Mahan Gap road.

Another excellent section appears on Providence road just west of Tenn 60. The lower red occurs about $\frac{1}{2}$ mi SE of junction of Roy Lane & Providence road. The upper red is well exposed just east of Providence Church. Here *Tetradium* ^{and *Pionodema*} ~~were~~ found just under it. About 0.1 mile east of the Providence church

(19)

in the woods not far north of the road is an excellent section of the beds above. The lower beds are red and yellow. These rocks are dove Louville type with rounded blobs of chert. On top of the cherty beds occur Mosheim type lined tones.

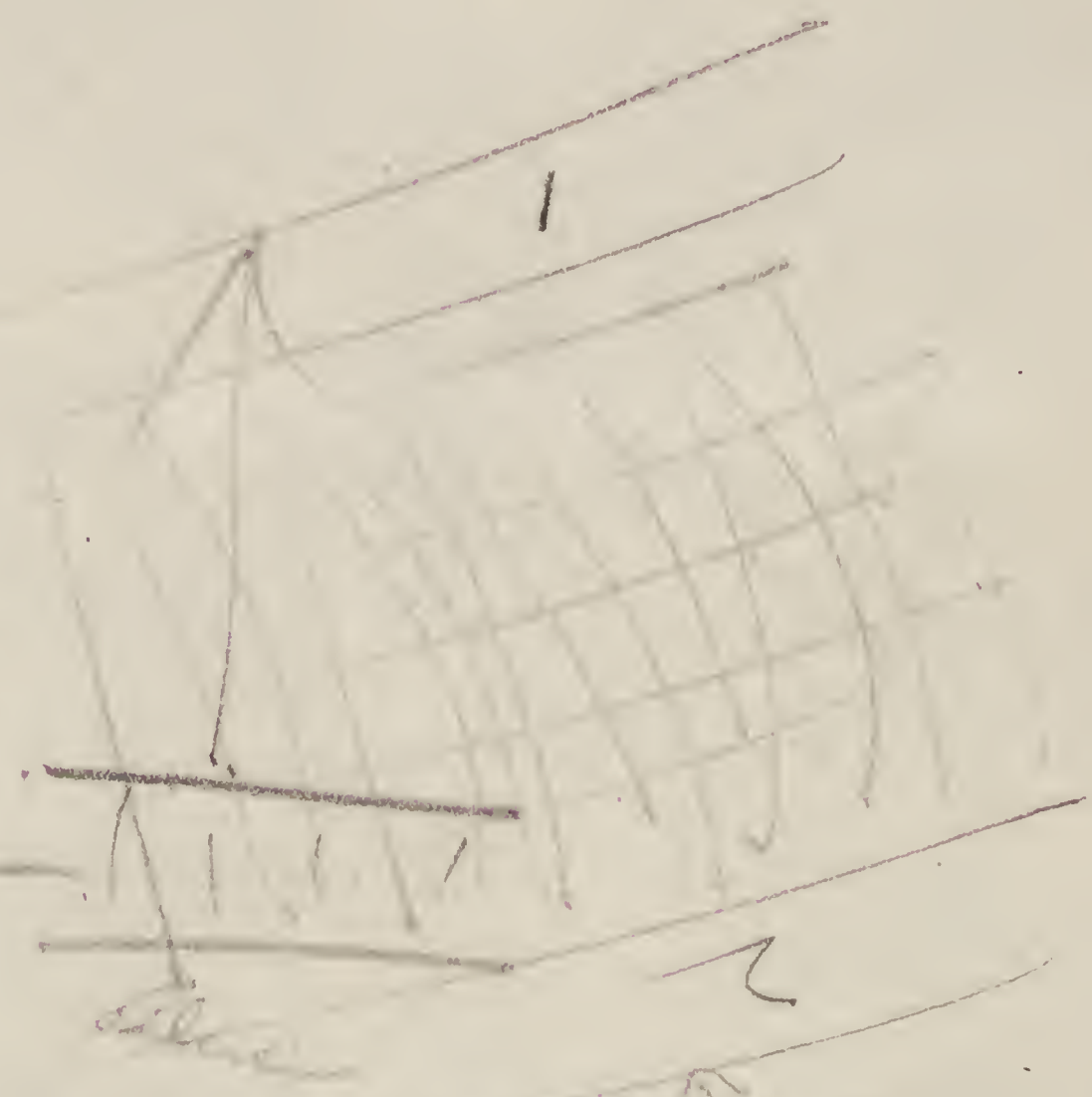
In this belt above the cherty beds occur Pionadenia and Zygospira. Higher and below the chert a few calcarenites produced abundant Doleroides. All this suggests Lebanon - Witten.

East of Snow Hill

Yellow & reddish
mud rock
Cane Creek

4"

Light blue
gray ls. Hardy Creek
Zygospira



Hardy Creek
Zygospira

Section 5-8

(20)

827

October 25 Went to St. Clair, Ampyx
americanus just on top of
Arlene beds suggests same
relationships as at Catawba.
At bridge over Robertson Creek
occur cobbly beds which suggest
middle Athens, the slabby and
lingy beds, in the cuts on the
Hibbassee River. It suggests
that the Arlene, the graptolite
shales and the cobbly, slabby
ls all are equal to type
Athens at least as displayed
at Charleston.

Ls ends about opposite 2nd
house S of bridge. On the curve
just south of the house is
hackly cleaving yellow shale.
On S side next St. bed comes
Sevier, massive blue weathering
yellow, nearly vertical.

Near Mooney Cemetery same
blue-gray yellow-weathering
rock. Contains a few fossils.

Thick bedded Sevier with
D. transversa just north
of road east, S of Mooney Cem.
Just S of road east come
limestone with *Cystid* plates
and *Oligorhynchia*. This is

(21)

covered by thin-bedded ls and some yellow shale. The limestone dark gray to black, fine-grained, mud-rock. Lithology well-mud-cracked. Axis of syncline just south of first house S of road east 0.7 mi N of Oates.

Cobbles just S of Whitehorn occur at base of cobbly beds above the shale. The Oates Lingulas must occur near the top of the cobbly beds.

Returned to section north of Oates to see mud-cracked beds. Coop (B.N.) identified the mud-cracked beds as his Bowen formation. Above the yellow gray mud-cracked beds come red beds near the middle of the hill. Above that we did not go. The Bowen was thought by BNC to be 60 feet thick. There would be little within there.

The section from St. Clair south is thus:

(22)

Thin skin of Witten on hilltop
 Bowler mud-cracked beds.
 Cystid + bryozoan beds with Oligorhy.
 Serier type shale.
 Hard sandy band with D. northi
 Serier sandy shale.
 Cobbley ls. and shale
 Dark shale with Graptolites
 Acline
 Mosheim

Returned to Gutline Gap. Found
 D. northi transverse about 0.4
 miles N of the church. The
 cystid beds appear 0.3 mile south
 of the church behind a house on
 east side road. Above these
 is a hard sandstone band
 suggesting the Teller ss.

On the hill just SE of the
 church are beds stuffed with
 bryozoans and cystid plates
 suggesting the Cystid bed
 above D. northi. Where exposed
 SE of the church it reverses
 dip. The beds above dip north
 and those on the other side

(23)

of the turn dip south. This
puts the *Zygospira* - *Oligorhynchia*
beds above the Cystid bed in
the hill beside the church and
also on the hill southeast of
the church where they dip south.
We saw no *Bower* in this
section.

1950

0831

Virginia Sept 19-23.

September 19 -

Visited locality @ 6.5 miles NE of Luster Gate. Large channel in Knox filled with thick succession of limestone. Near base *Postinella* abundant. Slightly higher *Dactylogonia* abundant. *Maclurea* beds overlies. The brachiopod beds and all covered by rock suggesting Lincolnshire but without any diagnostic fossils being seen. *Bakelant* overlies the whole.

About a mile or two SW at locality visited last year *Bakelant* lithology with fossils occurs in coarse calcarenites forming a great reefy mass.

The calcarenites at the base of the channel in the Knox are suggestive of the Lenoir beds about 3 miles SW of Marion, Va.

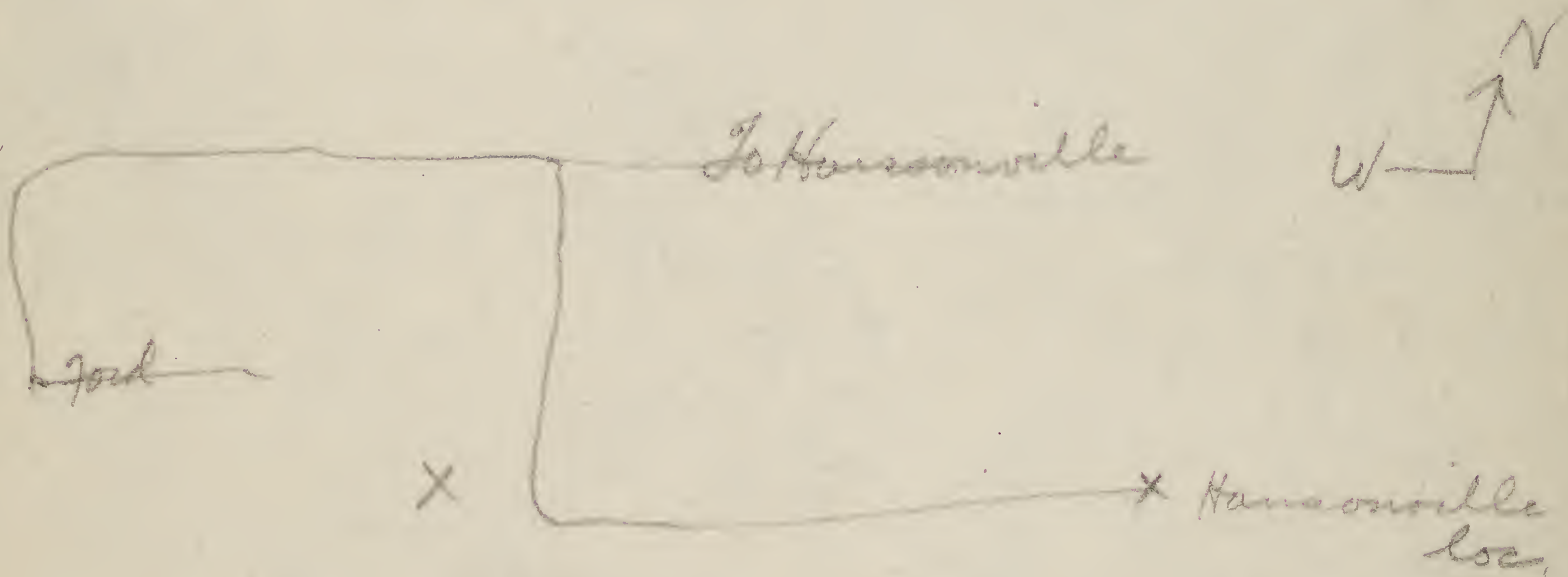
Lunch 70¢
Sept 20
" 21
" 22
" 23
70¢
20¢
60¢

September 20 - About 1.15 miles south of Luster Gate on road to Ellett. West of road long section has Blackford sh. beds at base followed by *Maclurea* bearing limestone with 2 bands of Mosheim lithology. This is followed by a thick section of shaly ls containing abundant *Hebertella* & *Multicostella*. *Opikina* is also present but rare. Black chert also present. This part is identified with White Creek. Above WC occurs black granular ls with

some chert. The lithology is like Lincolnshire.

Sept. 20¹ 0.6 mile farther south and on W side road red sandy shales occur in contact with Knox. Overlying this are Blackford-like dolomites followed by red-cherty thin-bedded ls. containing Minella. Above this is the Whistle Creek followed by Lincolnshire lithology. This is overlain by nodular ls. looking like upper Christiana Lenoir. Botetourt follows the nodular beds. Then comes a thin calcarenite and the Athens. Whistle Creek here abounds in a species of *Nidulites*.

Sept. 20² - About one mile south of Ellett on west side of road about 100 yards west of the Hq. about 10' above the Knox rock is crowded with *Rosticellula*. The rock also contains ragged fragments of chert. Rock above *Rosticellula* beds reminds strongly of lower Lenoir, shaly rock with blue patches. The rock has blue patches in a shaly matrix. Considerable dolomite occurs in the lower part of the section.



Sept. 21. - Visited Chatham Hill locality. Small parallel-sided *Sowerbyella* occurs about 50 or 60' below the *Oxoplesia* beds. The beds here are mapped as Athens and are on the same with the Athens at Saltville.

In afternoon visited Benbolt south of Hanesville and a locality

Sept. 22 - Visited Hagan school and new exposures at Cedar Point School. *Paleostrophomena* occurs in tongues of shaly-fracturing limestone suggesting upper Tenor beds.

Get Newman send Thesis

May 16-19, 1957

0834

Mileage at
start 1083

May 16.

Left Washington 9:30.

Arrived Harrisburg 12:30 EST

Went to Green Mount Church

and spent most of day in

its vicinity. Va. Co. by 617 has

been changed to Va. Co. by 910.

At junction of 777 and 761

on east side of 761 occurs an

excellent exposure of New

Market-Whistle Creek with

Lincolnshire at top of ridge

This can be followed as a

ridge nearly parallel to the

road to Co. by 721. At

Junction 721 and 910 (617)

occurs Martinsburg with

Cryptoliths.

On 910, west side about

0835

$\frac{1}{2}$ mile N of intersection of
910 + 777 occurs exposure of
Martinsburg with *Rensselaeria*
and abundant silicified
Cryptolithus.

South of Greenmont church
 $\frac{1}{4}$ - $\frac{1}{2}$ mile at junction of
Va 910 and 768 is Martinsburg
with Salina fauna. Here
I found a large *Rensselaeria*.

Some good brachiopods
were taken from a lane
just S of church and about
150 yards from church.

May 17.

Side road 1736 about 150 yds.
NE of U.S. 250 at Jennings Gap,
Overturned Martinsburg. Athens

0836

in lower part of section followed by *Nidulites* beds which are lowest part of section in the road cut. This is followed by Granular ls. (St. Luke?) or Colliers town. No *Oranda* was seen. Liny Martinsburg overlies the Granular beds. This has big *Lowerbyella* and large *Dalmanellids* suggestive of Curdsville. *Cypholittus* also present. It looks transitional between Curdsville and Martinsburg of eastern belts.

May 17.

Long and Thick sequence of *Oranda* just east of

0837

Junction of Va 616 and
Va. 699. The Oranda must
be 100' thick. Cryptolithus
abundant a long distance
above The Oranda. This is
locality of silicified Cryptolithus.
2.4 miles N23°E of Spring Hill, Va
May 18

0.1 mile NNE of Va. 617 and 753
on 617 is excellent section of
low Edinburg. Contact of
Botetourt with Lincolnshire
about 450 feet west of Va 617.
Base of Botetourt conglomerate
with ls. pebbles up to 4" in
diameter. Botetourt about 20-
25' thick. Beds above B. are
thin-bedded, often platy with
Tretaspis and Ampyxina.

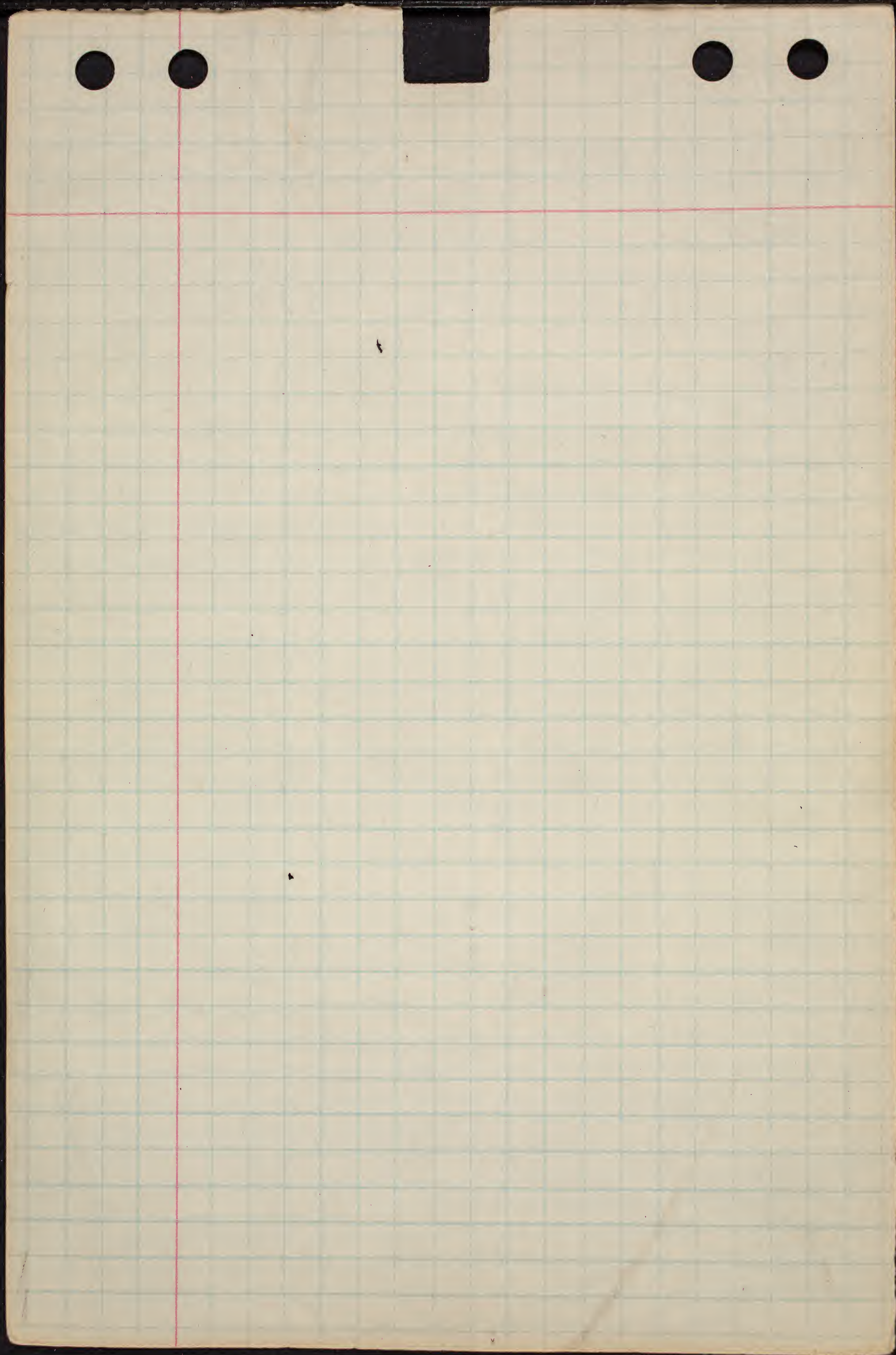
These are like Lacey Spring beds.
On east side of road in
lower Edinburg occurred a
lens of Christiania in black
heavy slabby ls.

Oranda

$\frac{1}{4}$ mile east on 782 of
junction with 617 is excellent
exposure of Oranda with an
excellently rotted bed.

Just east of Broadway
road 759 makes a U-loop.
Inside loop are excavations
for a new road. Here lower
Athens with Robergia and
Tretaspis. Also Elliptoglossa. Locality
is 0.2 mile W. of Va 42 intersection
with Va 259.

M 1752 Lincolnshire on
Va. hwy. 613 at east end of hill
1/4 mile west of sharp bend
on west side Long Blade about
2.7 miles N 80° E of Spring Hill,
Parnassus □, Va. good
exposures of Botetourt-Effra
and Lincolnshire.



0840

Millstream Cemetery
about 1 mi. E of US 11
3 mi. N of Whitehacker

Collyer
Ephraim
coarsely
granular
& with
f. sils
30'
Limestone
2-3'
Brunner
Cobbly
ls.
38'±
Concretionary

New
Market

UNITED STATES NATIONAL MUSEUM

Field Label

No. -----

FORMATION:

LOCALITY:

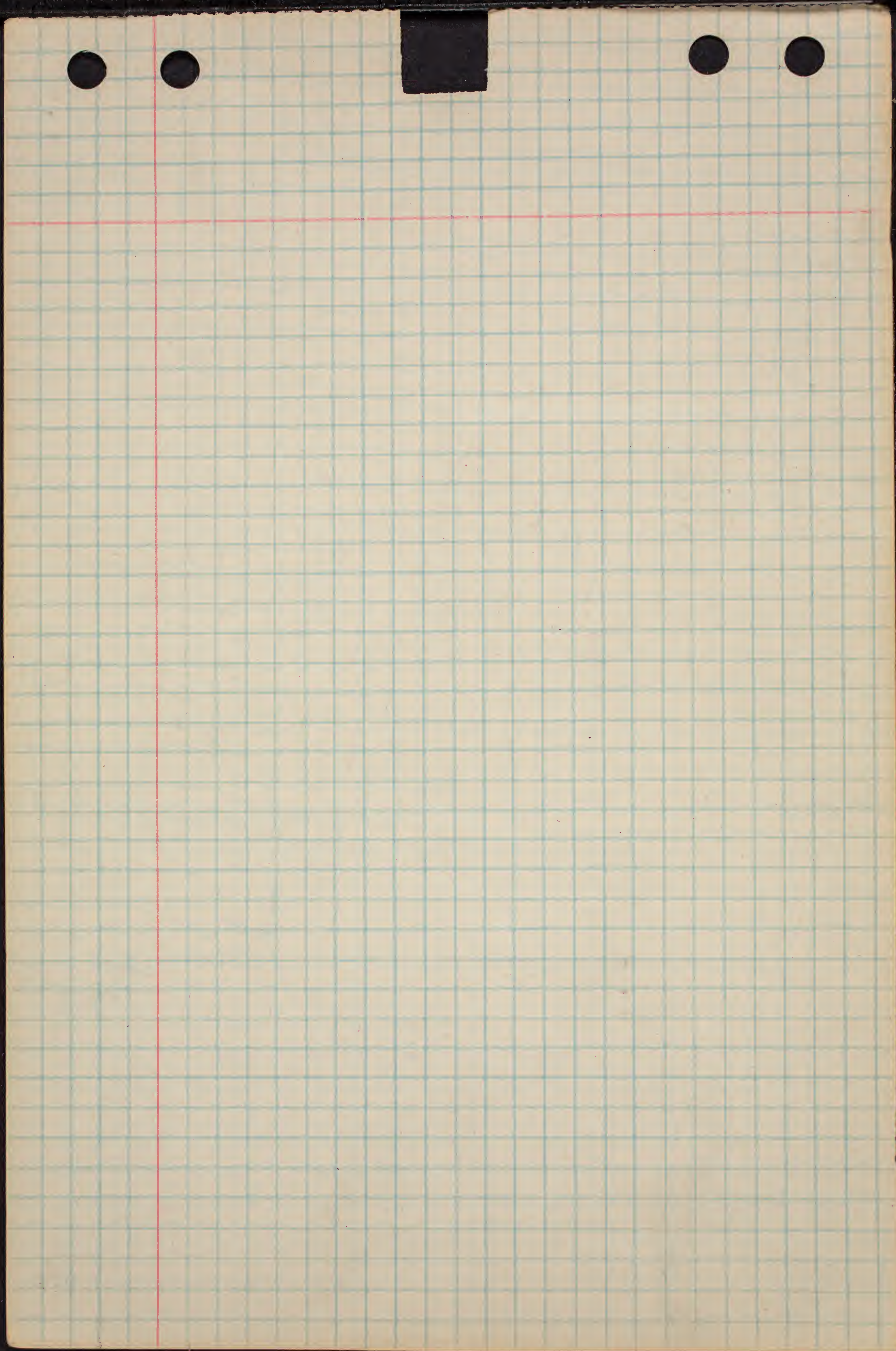
Collector:

Date:

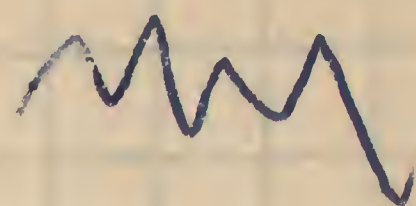
Note Book:

Page:

Memoranda:



July 9, 1955



① Consists of two parts. A. Along Conodoguinet Creek $\frac{1}{4}$ mile NW of bridge on west edge of Carlisle \square grayish limestone in upper part St. Paul group had *Trilobites* and *Oligorhynchia*.

B. Upper Chambersburg (Oranda) in swale on east side of dirt road going NE about 0.6 mile NW of bridge over Conodoguinet Creek on W edge Carlisle \square . Several pieces for etching.

② Dark St Paul or Lindsburgh ls with algae. First right (about $\frac{1}{4}$ mi. east of paved road) east of paved road on Newville sheet. between turnpike & river.

③ On New Bloomfield \square , $\frac{3}{4}$ mile east of Hagerstown on U.S. 11 and $\frac{1}{2}$ - $\frac{3}{4}$ mile W of U.S. 11. Chambersburg on both sides Conodoguinet Creek. at bridge

Lunch, .60; supper 1.50; room 3.50

breakfast .75, lunch .60 Supper 1.00

Check up on posterior

0858

June 17

Left Ancker about 8:30 A.M., reached
Ingersoll about 3:30 P.M. First quarry
just NW of Onkino Hy. 2 about
12 miles NE of Ingersoll, Quarry
of Chemical Lime Co. There are about
30-40 feet of Detroit River (probably
Lucas & possibly some Embury).
See wells under the Lucas comes
cherty beds of *Amphigenia* zone of
Lower Onondaga. The cherty zone
under the Lucas is probably
thicker than where it outcrops.

The Lucas is overlain by
Columbus with *Paraspirifer* very
wide-limbed *Spirifer* (*macrus*?),
many *Corbicula*, good typical
Columbus limestone. About 15' of
Columbus occurs at this quarry.
Almost in the city of Ingersoll a well
shows 45' of the cap rock (Columbus).
This could be partly Dundee or
Delaware.

In a quarry just SW of R.R. station
at Dunkirk is a deposit quarry with
Silurian in lower part and with
cherty Onondaga about 10' on top.
Here are many corals and a few
brachiopods including *Amphigenia*.
This is lowest Onondaga and
according to Dr. Ehlers (and belongs
under the Detroit River of the
Ingersoll Quarry.

27
2
51
23

76
2
153
38
191